Assessment of the Relevant Impacts of *Varecia rubra* (Red ruffed lemur) on the Environment (Assessment Report)

Consideration of an application under the Environment Protection and Biodiversity Conservation Act 1999 List of Specimens taken to be Suitable for Live Import

July 2022

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Department of Climate Change, Energy, the Environment and Water
GPO Box 3090 Canberra ACT 2601
Telephone 1800 900 090
Web dcceew.gov.au

Acknowledgement of Country

We acknowledge the Traditional Custodians of Australia and their continuing connection to land and sea, waters, environment and community. We pay our respects to the Traditional Custodians of the lands we live and work on, their culture, and their Elders past and present.

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Executive summary

An application was submitted to the Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW) to amend the Live Import List to include *Varecia rubra* (red ruffed lemur) for zoo and conservation breeding purposes.

A risk assessment was undertaken to evaluate the likelihood of establishment and spread in Australia, and the potential consequences of these impacts on the Australian environment. Several factors were considered during the assessment, including, but not limited to, available scientific evidence, biological and ecological traits of the species, environmental conditions for establishment (current and potential distribution of the species), conservation status, and potential impacts in the event of the establishment or spread of the species.

The red ruffed lemur is listed as critically endangered by IUCN and is listed on CITES Appendix 1. The import and export of CITES Appendix I listed live animals may only be carried out for the purpose of conservation breeding, education or research. The red ruffed lemur is only found in the tall forests of Madagascar and its diet consists of fruit, nectar, pollen, leaves and seeds. The species is not considered a pest and has not established feral populations anywhere in the world. Published peer-reviewed literature suggests that the red ruffed lemur would not have any deleterious consequences for the Australian environment should it establish a viable wild population.

Under s 391(1) of the EPBC Act, the Minister must take account of the precautionary principle in making decisions. The precautionary principle is triggered by two threshold conditions: 1) a threat of serious or irreversible environmental damage (direct or indirect); and 2) scientific uncertainty as to the environmental damage. After critically examining and reviewing all available evidence and information, the department has determined that the red ruffed lemur does not pose a threat of serious irreversible damage to the Australian environment; is not considered harmful to humans or other species and the impact on the environment is negligible (low). The department recommends listing the Red ruffed lemur (*Varecia rubra*) on Part 2 of the Live Import List with the import condition of: **Import for the purposes of conservation breeding in accordance with subsection 303FF(2).**

1 Introduction

1.1 Purpose of the proposed import

Darling Downs Zoo seeks to add *Varecia rubra* (red ruffed lemur) to the Live Import List 'to enable Australian licenced zoos to import founding breeding stock for conservation breeding and exhibition'. They propose to import, quarantine and house two pairs initially, and expect to be asked by other Australian licenced and registered zoos to import and quarantine specimens of this species on their behalf. If added to the Live Import List any registered zoo would also be allowed to import the species.

The imported animals will all have been captive bred in licenced overseas zoos eligible to export animals to Australia.

1.2 Background on the EPBC Act

Under section 303EC of the *Environment Protection and Biodiversity Conservation Act 1999* (**EPBC Act**), the responsible Minister may amend the *List of Specimens taken to be suitable for live import* (**Live Import List**) by, relevantly, including a specimen on the list. Section 303EB of the EPBC Act provides there are 2 parts to the Live Import List:

- Part 1 comprises specimens that can be imported without a permit under the EPBC Act and
- Part 2 comprises specimens that require a permit under the EPBC Act to be imported. For each specimen included in Part 2 of the list there is to be a notation regarding whether the inclusion is subject to restrictions or conditions. Restrictions or conditions may relate to a quantitative limit, the circumstances of import, the source of the specimen or the circumstances in which it was taken. Additional conditions may also be applied when the permit for import is issued.

Before amending the Live Import List, the Minister must consult with appropriate State and Commonwealth Ministers and other persons, and consider a report assessing the potential environmental impacts of the proposed amendment (section 303EC of the EPBC Act). When submitting an application to the department to amend the Live Import List, all applicants are required to provide an accompanying draft assessment report that addresses specific terms of reference published on the department website.

The department undertakes an assessment of the potential environmental impacts of the proposed amendment using the information in the applicant's draft report and any other sources of relevant information. The department also considers comments and information received through the public consultation process (including states and territories). The application and accompanying draft report for the proposed import of *Varecia rubra* (red ruffed lemur) was open for public comment between 16 June and 28 July 2021.

This assessment report on the potential environmental impacts of listing the species was prepared in accordance with Section 303EE of the EPBC Act. Under Section 303EC(5)(a) the Minister must consider this report before amending the list.

2 Biology and Ecology of Varecia rubra

2.1 Description

Varecia rubra (red ruffed lemur) is a large rust coloured lemur from the tall tropical forests of north-eastern Madagascar (Mittermeier et al. 2010, Vasey 2003, 2005). *V. rubra* are the largest pollinators in the world, carrying pollen on their faces as they move from tree to tree to feed.

V. rubra is one of the largest primates in Madagascar. The species is active during the day and conspicuously vocal. It has a body length of up to 53cm, a tail length of up to 60cm and weight of 3.3 to 3.6kg. The species is easy to identify as it is the only lemur to have a ruff and coat of soft, thick rust coloured fur with a black tail, face, feet and belly and a white or cream-colored spot at the nape (Figure 1). Females are slightly larger than males.

The average lifespan of *V. rubra* in the wild is expected to be approximately 20 years, and in captivity upwards of 35 years (Eddie et al, 2017). The oldest female to give birth in captivity was almost 30 years old (Eddie et al, 2017).

Figure 1: *Varecia rubra* (Red ruffed lemur) (source: Tim Knight (Wildlife Web)

2.2 Taxonomy

Kingdom: Animalia

Phylum: Chordata

Class: Mammalia (mammals)

Order: Primates (primates)

Suborder: Strepsirrhini (prosimians)

Family: Lemuridae (lemurs)

Genus: Varecia

Species: rubra

Subspecies: None

Common name: red ruffed lemur or red-ruffed Lemur

Synonyms: *Lemur ruber* (E. Geoffroy St-Hilaire 1812). *Prosimia erythromela* (Lesson 1840). *Lemur variegata rubra* (E. Geoffroy St-Hilaire 1812). *Varecia variegata rubra* (E. Geoffroy St-Hilaire 1812).

Varecia rubra (red ruffed lemur) was originally described by E. Geoffroy St-Hilaire in 1812 as *Lemur ruber* but was considered a subspecies of the Black and White Ruffed Lemur *Varecia variegata*. The species was also known as *Lemur variegata rubra* or *Varecia variegata rubra* until it was declared a full species by Groves in 2001.

2.3 Habitat/special adaptations

V. rubra inhabit primary and some secondary tropical moist lowland forest (to 1200 m) of the Masoala Peninsula in northern Madagascar. The climate is hot and humid year-round with pronounced wet (December to March) and dry seasons (May to September) (Vasey, 2005). The species are diurnal (active during the day) and arboreal - requiring the presence of large, crowned trees – in which they feed on fruits - dispersing the seeds as they move. In areas where their niche requirements are not met, they expand their range and reduce the size of their community (Vasey, 2005).

V. rubra sleep in the trees and stash their young in a nest in the tree canopy, 10-20m off the ground for security (Vasey, 2005 and Vasey, 2007). The adults of the group guard the young whilst the mother feeds. Alloparenting or shared parenting is commonly practiced in groups of *V. rubra*. Infant mortality is high due to predation and falling from the tree-tops with up to 65% of young not reaching 3 months of age. Surviving young develop rapidly, moving around and attempting to follow their mother by 1 month and they are weaned by 4 months old.

V. rubra have developed specific physical adaptations including 6 specialized incisor teeth, located at the bottom front of the mouth which form a toothcomb that is used to peel certain fruits. Their toothcomb also helps them with grooming. A specialized claw, longer than the other claws and located on the second toe of each hind foot, provides further grooming assistance.

2.4 Diet

The diet of *V. rubra* consists primarily of fruit, nectar and pollen, leaves and seeds. *V. rubra* are highly frugivorous seed dispersers with fruits accounting for 61% of their diet (Martinez and Razafindratsimba 2014).

2.5 Home range and social structure

V. rubra live in large groups of up to 30 individuals, with multiple males and females. They have total home-ranges of up to 60 hectares depending on food availability or breeding requirements. Sub-groups may contain only 2 to 5 individuals. They have a polygamous mating system, and related and unrelated young may be reared cooperatively, including nursing of young by unrelated females.

V. rubra are not migratory and do not hibernate or aestivate but are active year-round. Groups of varying numbers of animals will move throughout their home range in search of food resources. In the winter months, June to August, individuals are up to 60% less active that at other times of the year due to less available fruit (Vasey, 2005).

Male and female *V. rubra* are distinct sexes, (i.e. not hermaphroditic, and parthenogenetic births are not possible), and they cannot change sex (Napier and Napier, 1985).

Hybridisation in lemurs is well known to occur in the wild and in captivity (Vasey and Tattersall, 2002). Where the distribution of *V. rubra* and the black and white ruffed lemur *(Varecia variegate)* meet hybridisation is known to result in fertile offspring.

2.6 Environmental tolerances

V. rubra require a habitat with large-crowned fruit bearing trees in which to survive. The only vegetation type that would be suitable in Australia is rainforest and the only rainforest with the required warm climate is found in the Wet Tropics of Queensland.

In the wild lemurs are preyed on primarily by Madagascar's top predator the fossa (*Cryptoprocta ferox*) an agile tree dwelling relative of the civet or mongoose. Boa constrictors, raptors and humans are also natural threats to *V. rubra*.

In Australia escaped *V. rubra* would potentially be preyed on by birds of prey and large snakes. Terrestrial predators such as quolls, feral cats and foxes would have little impact on tree-dwelling lemurs.

2.7 Range Description

V. rubra has a very small natural range, totalling approximately 6,423km^2 restricted to the remaining primary forests of the Masoala Peninsula in north-eastern Madagascar (Borgerson et al., 2020) (Figure 2). The species is protected by law in Madagascar but is severely threatened by illegal hunting (for food) and by habitat destruction for agriculture and illegal logging. The small natural range is now also threatened by extreme weather patterns.

Figure 2: Distribution Map - *Varecia rubra* (red ruffed lemur). The IUCN Red List of Threatened Species. Version 2021-1 (Borgerson et al, 2020)

2.8 Characteristics that may cause harm to humans or any other species

V. rubra have large teeth and powerful jaws that would be capable of inflicting puncture wounds on humans. The small/medium size of the animals and their peaceful inoffensive nature ensures that they are not considered a threat to humans. In captivity they are often kept in walk-through enclosures where the visiting public can walk through their living space (application).

3 Current status in Australia

3.1 History in Australia

V. rubra have never been kept in Australia although closely related species of lemur have been held and bred in Australia in zoos over the last 100 years (applicant and EIC, 2021).

3.2 Related Live Import Listings

There are 2 lemurs on the Live Import List. Both species – the black and white ruffed lemur (*Varecia variegate*) and ring-tailed lemur (*Lemur catta*) - are on Part 2 and listed as 'non-commercial purposes only, excluding household pets'. Only these 2 lemur species have ever been present in Australia (EIC, 2018).

There are currently approximately 215 animals of the 2 species of lemur held in Australian zoos as (contained) breeding populations (Australian zoo census data from Zoo and Aquarium Association (ZAA) – accessed October 2021).

The Global Invasive Species Database (GISD, 2020) does not include any records of these 2 species forming feral populations or having any detrimental environmental impacts anywhere in the world.

3.3 Related Threat Category Listings

Within its natural range *V. rubra* is not considered a pest in any economic way. *V. rubra* is not included in the Environment and Invasives Committee's 2021 '*Australian List of Threat Categories of Non-indigenous Vertebrates' (EIC, 2021)* for vertebrates that are or have been in Australia. There are two Lemuridae in the EIC list, see Table 1.

Table 1: Lemuridae species included on the Australian List of Threat Categories of Non-indigenous Vertebrates (EIC, 2021).

Order/Family	Scientific Name	Common Name	Threat category
Primates/Lemuridae	*Lemur catta*	Ring-tailed lemur	Extreme (P)
Primates/Lemuridae	*Varecia variegata V. v. variegata*	Ruffed lemur, Black-and-white Ruffed lemur	Extreme (P)

The Lemuridae species listed in Table 1 are assigned a threat category rating of 'Extreme (P)'. If a species has not been assessed or if there is too little information to be able to properly adopt a risk analysis approach, the precautionary approach has been adopted by the EIC and the species assigned to an 'Extreme (P)' where 'P' stands for Precautionary.

3.4 Conservation Status

The IUCN Red List states that the *V. rubra* is critically endangered (Borgerson et al, 2020). Of the 107 lemur species found in Madagascar, 33 are listed as Critically Endangered with the remainder listed as Endangered or Vulnerable (Borgerson et al, 2020).

The IUCN states that 'the principal threats are habitat loss and hunting'. The range of this species has been impacted by frequent cyclones, deforestation from subsistence agriculture, subsistence collection of timber and non-timber forest products, illegal commercial harvesting of hardwood timbers and subsistence hunting due to low food security in the region (Borgerson et al, 2020).

V. rubra is listed by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) on Appendix I (CITES, 2021). Appendix I lists species that are the most endangered among CITES-listed animals and plants that are threatened with extinction. CITES prohibits international trade in specimens of these species except when the purpose of the import is not commercial, for instance for scientific research and conservation breeding purposes (CITES, 1983). Fifty five of the 107 Madagascan lemur species are listed on Appendix I. Most primates including 9 species of Madagascan lemur are listed in Appendix II - species not currently threatened with extinction but could become so if trade is not regulated (CITES, 2021).

The import of CITES Appendix I listed animals into Australia is regulated by the EPBC Act and may only be carried out for the purpose of conservation breeding, education or research. For zoos, wildlife parks or aquaria, import of such animals is generally only permitted for the purpose of conservation breeding (DAWE, 2022). Section 303FF of the EPBC Act provides that a conservation breeding permit cannot be issued unless the animal is going into an approved cooperative conservation program for that species, the object of which is the establishment and/or maintenance of a breeding population. Approval of a cooperative conservation program is dependent on satisfying the requirements of EBPC Regulation 9A.12. There is no current cooperative conservation program for *V. rubra (*DAWE, 2022a) in Australia, and the Zoo and Aquarium Association of Australasia (ZAA) has indicated that the species has not been identified as a priority for import or management by the ZAA Taxon Advisory Group.

As *V. rubra* is listed under CITES it can only be included in Part 2 of the Live Import List (Section 303EB(5) of the EPBC Act).

If added to the Live Import List, the importation of *V. rubra* for zoological purposes would also require permits under the EPBC Act and the *Biosecurity Act 2015* from the Commonwealth Department of Agriculture, Water and the Environment and adherence to any import conditions that are set.

4 Risk Assessment

4.1 Bomford Risk Assessment Model

Modelling is used to assesses the risk of *V. rubra* establishing and spreading in Australia, and any likely impacts on the Australian environment.

The likelihood of *V. rubra* establishing was assessed under the Bomford Risk Assessment Model (Bomford, 2008 - Chapter 2 – Exotic Mammals and birds) in accordance with the 3 key factors of establishment success. These factors are:

- Risks posed by captive or released individuals,
- Risk of establishment
- Risk of becoming a pest

Using information compiled from research into the above factors for *V. rubra*, the potential impacts of the establishment of feral populations can be estimated. The factors are discussed below and results shown in the summary Table 2.

4.2 Risks posed by captive or released individuals

Despite *V. rubra* having large teeth and jaws powerful enough to inflict puncture wounds on humans this species is known for its peaceful inoffensive nature so is not considered a threat to humans. The applicant states that captive *V. rubra* are often kept 'in walk-through enclosures where the visiting public can walk through their living space'.

4.3 Risk of establishment

Establishment is defined as the 'perpetuation for the foreseeable future, of a pest within an area after entry' (FAO, 2019). *V. rubra* have a low reproductive rate with only one offspring expected to survive every two years (Brockman et al. 1987 in Borgerson et al, 2020) and a relatively long lifespan (up to 20 years in the wild (Eddie et al, 2017)). These characteristics could potentially restrict *V. rubra* from establishing wild populations in Australia if any escaped. However, the low likelihood of individuals escaping could prevent this species from establishing.

4.3.1 History of Establishing elsewhere

As noted above, there is no record of this species successfully establishing anywhere outside its natural range.

4.3.2 Climate match

The climate match program 'Climatch' which compares the native range of *V. rubra* to Australian climates indicates that the *V. rubra* has a low climate match to Australia (Figure 3). This species has a highest Climatch class of '8' indicating that most of Australia is climatically quite different to their natural habitat. All the matching habitat corresponds to coastal regions in central and northern Queensland and the far north of the Northern Territory and Western Australia.

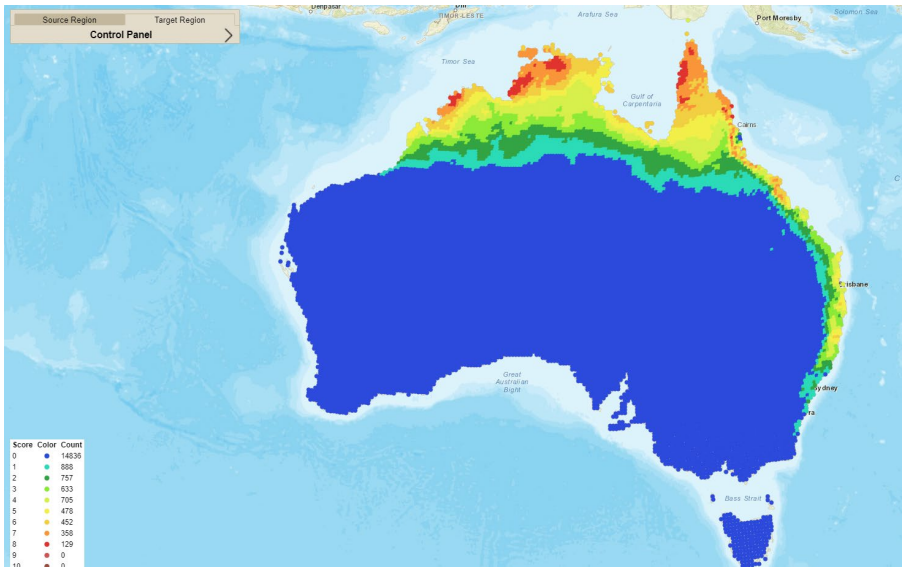

Figure 3: Climatch predicted range

4.3.3 Hybridisation

Hybridisation is known to occur in the wild where the distributions of two related lemur species meet, creating "hybrid zones". Red ruffed lemurs have been recorded on multiple occasions hybridising with the closely related black and white ruffed lemur (*Varecia variegate*) in the wild and in captivity (Vasey and Tattersal, 2002). The hybridisation of the different lemur species results in fertile offspring (Vasey and Tattersal, 2002).

There are no primates native to Australia, therefore there is no risk of red ruffed lemurs hybridising with Australian native fauna.

4.4 Risk of becoming a pest

4.4.1 Potential impacts of established feral populations

Within its natural range *V. rubra* is not considered a pest in any economic way (Borgerson et al, 2020). The Global Invasive Species Database (2020) does not list any member of the lemur species as being invasive. As fruit and flower eaters, lemurs are seed and pollen dispersers (Martinez and Razafindratsimba, 2014), spreading seeds through their faeces and fur. These could potentially include the seeds of invasive and unwanted species.

V. rubra feed largely on fruits, nectar, flowers and leaves therefore they would likely find food sources in most forested habitats in tropical Australia. In terms of competition for food resources, Australian-native arboreal mammal species can display diverse feeding habits, feeding on leaves, fruits, flowers and nectar (Menkhorst and Knight, 2011). *V. rubra* could compete for fruit, nectar and flowers, with native arboreal mammals. They will feed on alternative food sources when fruit becomes scarce during the dry season.

V. rubra make nests for their young and do not use tree hollows so would not compete with native arboreal animals for tree hollow resources.

4.5 Bomford Risk Assessment Model Summary

The risk factors discussed above are summarised in Table 2.

Table 2: Australian Bird and Mammal Risk Assessment Model (Bomford, 2008)

Australian Government
Department of Agriculture, Water and the Environment

Australian Bird and Mammal Risk Assessment Model

Species identification and sources

Common name	Red ruffed lemur
Scientific name	*Varecia rubra*
Date assessed	5-Jun-21
Literature Search Type and Date:	Google Scholar, IUCN

Risks posed by captive or released individuals	**Value**	**Comment**
A1. Risk to people from individual escapees (0–2)	1	An animal that can make unprovoked attacks causing moderate injury (requiring medical attention) or severe discomfort but is highly unlikely (few if any records) to cause serious injury (requiring hospitalisation) if unprovoked = 1
A2. Risk to public safety from individual captive animals (0–2)	0	nil or low risk (highly unlikely or not possible)
A. Risk posed by captive or released individuals (= Sum of A 1 to 2).	**1**	**Moderately dangerous**

Risk of establishment	**Value**	**Comment**
B1. Climate Match Score (1–6)	1	Confined to far northern Australia (primarily Cape York and northern NT).
B2. Exotic Population Established Overseas Score (0–4)	0	No exotic populations ever established.
B3. Overseas Range Size Score (0–2)	0	Overseas range in Madagascar approximately 6,000km^2
B4. Taxonomic Class Score (0–1)	1	Mammal
B5. Diet Score (0–1)	1	*Varecia rubra* is a fruit eater but will also eat leaves so a generalist with a broad diet of many food types.
B6. Habitat Score (0–1)	0	Only lives in undisturbed (natural) habitats.
B7. Migratory Score (0–1)	1	Non-migratory.
Model		
B. Risk of Establishment (Model 1 = Sum of B1 to B4; Model 2 = Sum of B1 to B7).	**4**	**Low Establishment Risk**

Risk of becoming a pest	**Value**	**Comment**
C1. Taxonomic group (0–4)	0	Varecia rubra is not a member of any of the identified taxonomic groups.
C2. Overseas range size including current and past 1000 years, natural and introduced range (0–2)	0	The current area of occupation is less than 10,000 km^2. In the last 1000 years the extent was no larger than the whole of Madagascar (<10 million square kms).
C3. Diet and feeding (0–3)	3	*Varecia rubra* is primarily a browser - and eats fruits, flowers and leaves.
C4. Competition with native fauna for tree hollows (0–2)	0	*Varecia rubra* does not use tree hollows.
C5. Overseas environmental pest status (0–3)	0	Varecia rubra has never been reported as an environmental pest in any country or region.
C6. Climate match to areas with susceptible native species or communities (0–5)	5	The species has more than 100 grid squares within the highest four climate match classes, that overlap the distribution of any susceptible native species or ecological communities = 5
C7. Overseas primary production pest status (0–3)	0	*Varecia rubra* has not been identified in the literature as a primary production pest.

C8. Climate match to susceptible primary production (0–5) **Hint: Use the "commodity" sheet created when a CLIMATCH grid is opened.**	1	Low (species has attributes making it capable of damaging this or similar commodities and has had the opportunity but no reports or other evidence that it has caused damage in any country or region)
C9. Spread disease (1–2)	2	Species is mammalian. Score of 2 is predetermined.
C10. Harm to property (0–3)	1	Lemurs have small sharp claws and sharp teeth, however the very small size of the animals restricts the amount of damage to property or ecosystems. The limited potential range of this species within Australia, according to the Climatch modelling, indicates limited interaction between this species and the environment or property. Hence the score of 1.
C11. Harm to people (0–5)	2	Lemurs have small sharp claws and sharp teeth and are capable of inflicting minor wounds on humans. However, the very small size of the animals reduces the incidence of serious injuries.
C. Pest Risk Score (= Sum of C 1 to 11).	**14**	**Moderate**

Summary	**Value**	
A. Risk to public safety posed by captive or released individuals	**1**	**Moderately dangerous**
B. Risk of establishing a wild population	**4**	**Low Establishment Risk**
C. Risk of becoming a pest following establishment	**14**	**Moderate**

Disclaimer This risk assessment does not account for everything that is likely to affect to the risk of establishment.
It should be interpreted in the light of any other information you may have.

The Bomford model results (Table 2) shows a **moderate** risk of *V. rubra* becoming pest following establishment as the species:

- poses a **MODERATE** danger to the public from either captive or released individuals.
- a **LOW** risk of establishing a wild population in the Australian environment if released.
- a **MODERATE** risk of becoming a pest if it were to establish.

5 Risk mitigation

The Bomford risk assessment (Table 2 above) indicates that the species has a **Moderate** potential for establishing in Australia and a **Moderate** risk of becoming a pest if it were released. The mitigation measures proposed, including the animals being kept in a secure facility at an approved zoo, reduces the likelihood that they would escape or be released, transmit diseases or be stolen (Table 3).

Table 3: Summary of risks and mitigation measures

Risk	Likelihood	Impact	Mitigation measures	Overall risk
Release or escape of adult specimens	Very low	Negligible	Only kept in secure cages in zoos	Negligible
Release or escape of immature specimens	Very low	Negligible	Only kept in secure cages in zoos	Negligible
Disease transmission to native species' populations	Very low	Negligible	Only kept in secure cages in zoos. Individuals will be vet checked prior to export and arrival and will under the 'Importation of captive non-human primates' biosecurity import risk assessment and will be subject to requirements to manage the biosecurity risks by the Department of Agriculture, Water and the Environment quarantine procedures.	Negligible
Theft and deliberate release	Low	Negligible	Previous thefts of primates in Australia were of small marmosets which were taken for the pet trade – deliberate release is unlikely and survival in the wild unlikely.	Negligible

The department considers that any risks posed by this species establishing a feral population and impacting on the environment would be adequately mitigated by including the species on Part 2 of the Live Import List, as is required as it is CITES listed, with conditions limiting the import of live animals for approved conservation breeding programs in zoos only.

5.1 Concerns raised and responses

The department undertook consultation with relevant state and territory government ministers (or their delegates), government agencies and the public from 17 June – 28 July 2021. The department received no responses.

As the applicant claims that 'the purpose of this application is to establish the mechanism to allow the import of Red Ruffed Lemurs for a Zoo and Aquarium Association [ZAA] managed species population' and that 'a meeting of the Association's Primate Taxon Advisory Group

[TAG] has endorsed the addition of Red Ruffed Lemurs to the region's management programs' (see application, point 10), the Department approached ZAA for confirmation in August 2021. ZAA responded that 'the Zoo and Aquarium Association Australasia (ZAA) coordinates a number of intensively managed programs for primates in our region, which operate under the ZAA Species Management Program. Currently, no such program is in place for Red Ruffed Lemur, and the species has not been identified as a priority for import or management by the ZAA Primate Taxon Advisory Group. Additionally, ZAAs Census and Planning Online System, the system through which Members highlight their intent to house a species, indicates that there is no registered interest for the species in the ZAA Membership at this time.'

A second consultation round seeking comment from state and territory government agencies on the applicants' reports and the Department's updated Risk Assessment Report was undertaken from 3 to 31 March 2022. Comments were received from the Tasmanian, Victorian, Queensland and South Australian Governments. Comments received included:

1. Support for the amendment provided the species is imported only for the purposes of conservation under the auspices of an agreed, formal conservation plan'.

2. As a prohibited species under Victorian legislation, the Victorian government outlined the permit conditions that must be complied with to keep this species in Victoria. This permit would only be approved in exceptional circumstances.

3. The Queensland government does NOT support including the species on the Live Import List due to there being no current conservation breeding program in place for this species by peak industry body - the Australian Zoo and Aquarium Association (ZAA).

4. The South Australian government is supportive of the application and supplied some suggested edits to the Department's risk assessment scores.

6 Discussion

In their native habitat *V. rubra* require large trees with a connected canopy for foraging for food and protection from predators. They do not survive in disturbed habitats – reducing the potential range in Australia to the rainforests in the wet tropics of Queensland and remote pockets of rainforest elsewhere across northern Australia. Due to the predicted low numbers of animals likely to be imported into Australia, and therefore to escape, the species would be unlikely to establish a self-sustaining feral population.

The application states that many species of lemur have been held in zoos worldwide and there have been no reports of them establishing wild populations in any of these countries. *V. rubra* has never established wild breeding populations outside of its natural range (Long, 2003).

7 Conclusion

Having undertaken an analysis and reviewed the available information, the department considers that the red ruffed lemur (*Varecia rubra*) has a **low** potential for establishing and becoming a pest in Australia due to its need for closed canopy undisturbed forest, restricted climatic range and history of never establishing a feral population.

The red ruffed lemur is listed as critically endangered by IUCN and is listed on CITES Appendix 1. The import and export of CITES Appendix I listed live animals may only be carried out for the purpose of conservation breeding, education or research. For zoos, wildlife parks or aquaria, import or export of such animals is generally only permitted for the purpose of conservation breeding. Section 303FF of the EPBC Act provides that a conservation breeding permit cannot be issued unless the animal is going into an approved cooperative conservation program for that species, the object of which is the establishment and/or maintenance of a breeding population. Approval of a cooperative conservation program is dependent on satisfying the requirements of EBPC Regulation 9A.12.

In Australia there is no cooperative conservation program in place for *V. rubra*, nor is one planned or prioritised by the Zoo and Aquarium Association of Australia (ZAA). The importation of the species for 'conservation purposes' is therefore not possible under the EPBC Act. If a cooperative conservation program is developed and approved, the species may be permitted to be imported under that program.

Consequently, the department recommends listing *Varecia rubra* (red ruffed lemur) on Part 2 of the Live Import List with the condition, as per section 303FB(d): **Import for the purposes of conservation breeding in accordance with subsection 303FF(2).**

8 References

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