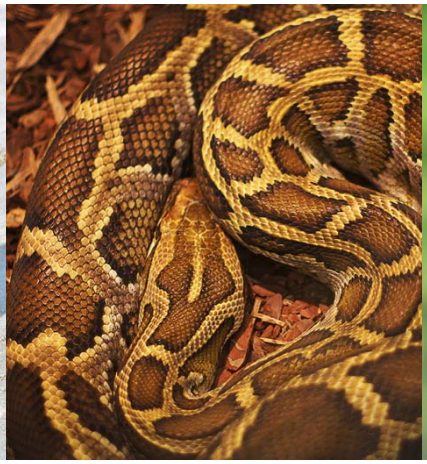
Guidelines for the Import, Movement and Keeping of Non-indigenous Vertebrates in Australia

January 2014



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Contact
Department of Agriculture
Postal address GPO Box 858, Canberra ACT 2601
Switchboard 02 6272 3933
Facsimile 02 6272 4875
Email invasives@agriculture.gov.au
Web www.agriculture.gov.au

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These guidelines were produced in response to the Vertebrate Pests Committee members request to review and update the 2004 Natural Resource Management Standing Committee – Guidelines for the Import, Movement and Keeping of Exotic Vertebrates in Australia and to address the outcomes of a risk assessment workshop held in Canberra in February 2009 (Henderson 2009).

Main image Gray Squirrel, www.shutterstock.com

Small images (L-R) Green Iguana, House Crow, Anaconda and African Wild Dog www.shutterstock.com

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EXECUTIVE SUMMARY

These guidelines outline a national approach within the context of Australian Government, state and territory legislation to minimise the risks posed by the importation (both into Australia and from one jurisdiction to another), movement and keeping of non-indigenous vertebrates. The guidelines were produced by the Vertebrate Pests Committee (VPC) and update the previous guidelines that were published in 2004, 1991 and 1983.

The guidelines focus on the development of appropriate strategies to prevent the establishment of new species that pose significant risk to the environment, primary production or social values including public safety. The adopted approach to managing non-indigenous vertebrates is based on the principles for vertebrate pest management now accepted across Australian jurisdictions.

The VPC considered the various scientific approaches that can be used to assess and manage the risks associated with the import and keeping of non-indigenous vertebrates. The most valuable approach has come from published scientific knowledge relating to the probability of establishment, and the potential to have negative impacts on environmental, economic and social values, including public safety. This scientific knowledge comes from detailed studies of past introductions of non-indigenous species within Australia and/or overseas, and the factors that affect establishment success and pest status. Potential for the spread of diseases that are not known to occur in the natural environment in Australia is an additional factor that has come to prominence in recent years.

A significant element of these guidelines will be the risk assessment models for establishment of exotic vertebrates in Australia and New Zealand (Bomford 2008) and earlier reviews and models (Bomford 2006, Bomford et al 2005 and Bomford 2003) and any future updates agreed to by VPC.

Guidelines for managing the risk posed by species within each of the four VPC Threat categories identified by the risk assessment models and/or the policy principles outlined in Section 3.4 are detailed in Section 4.

Whilst this document concentrates on risk assessment and risk management, it also recognises that risk communication is important. There should be an open exchange of information between risk assessors, risk managers and those who will be affected by the decisions taken.

DEFINITIONS, ABBREVIATIONS AND ACRONYMS

ACS – Australian Customs Service.

Animal – Any living thing that is a vertebrate (but not a human being) and includes the ovum, semen or any other genetic material of an animal; and an animal when in the embryonic or larval stage or any other immature stage.

APAS – Australian Pest Animal Strategy.

Appropriate Jurisdiction – Relevant state, territory or Australian Government authority; usually a state or territory Department of Natural Resources, Environment, or Agriculture and the Australian Government Departments of Sustainability, Environment, Water, Population and Communities, or of Agriculture, Fisheries and Forestry.

CBD – International Convention on Biological Diversity.

CITES – Convention on the International Trade in Endangered Species of Wild Fauna and Flora.

Department of Agriculture – The Australian Government Department of Agriculture.

Department of Environment – The Australian Government Department of the Environment.

EBRKS – Exotic Bird Record Keeping Scheme run by the Australian Government to encourage people who keep, breed or trade in exotic birds to keep appropriate records, both as a matter of good practice, and to conform to a responsible approach given the importance of controlling illegal trade and protecting Australia's biodiversity.

EPBC Act – The (Commonwealth) *Environment Protection and Biodiversity Conservation Act 1999*.

Eradication – When a species has been removed or killed and can no longer be detected by recommended methods of survey for a defined period of time.

ERR – Establishment Risk Rank.

Establishment Risk Rank – Ranking derived from the Establishment Risk Score, used to predict the relative risk of escaped or released individuals establishing a free-living population.

Feasibility of eradication – Criteria under Schedule 4 of NEBRA that must be satisfied for responses to nationally significant biosecurity incidents. Criteria are also applicable for non-cost shared responses to indicate whether eradication can be achieved.

Import – Import into Australia or into an external territory (e.g. Cocos (Keeling) Islands) from another country or by way of introduction from the sea and the import from one jurisdiction to another.

Introduced Species – Non-indigenous plant or animal deliberately or accidentally introduced into a new habitat that is outside its natural geographical distribution. Non-indigenous species is an alternative term.

Invasive Species – An exotic species that establishes a wild population and spreads beyond the place of introduction and becomes abundant (Richardson et al 2000).

IRA –The import risk analysis (IRA) process is a science-based, open and transparent process managed by Department of Agriculture, usually for a group of species (such as primates, carnivores etc).

IUCN – International Union for Conservation of Nature

Keeping – The containment (maintenance and holding) of species for a number of reasons including but not limited to keeping as pets, fancying, food, medicine, agricultural or recreational purposes, conservation, exhibition or research.

Live Import List – The list of specimens taken to be suitable for live import, made under the EPBC Act and managed by Department of the Environment.

Movement – Movement of an animal between jurisdictions. Interstate or intrastate movement of a species within Australia is primarily regulated under state legislation unless there are specific conditions relating to the movement of a specimen under the *Environment Protection and Biodiversity Conservation Act 1999* or *Quarantine Act 1908*.

NBC – National Biosecurity Committee.

NEBRA – National Environmental Biosecurity Response Agreement, an agreement to establish national arrangements for responses to nationally significant biosecurity incidents with predominantly public benefits.

Non-indigenous Vertebrate – All mammals (excluding humans), birds, reptiles and amphibians not indigenous to Australia, including hybrids between both non-indigenous and non-indigenous species and indigenous and non-indigenous species – noting that fish not indigenous to Australia are the subject of separate guidelines. (This definition Department of the Environments not include species indigenous to one part of Australia but non-indigenous to other parts.)

NRMMC – Natural Resource Management Ministerial Council.

NRMSC – Natural Resource Management Standing Committee.

OFMIG – Ornamental Fish Management Implementation Group.

Pest Risk Rank – Ranking derived from the Pest Risk Score, used to predict the relative risk of a species becoming a pest.

Precautionary Approach – Where there is a threat, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimise such a threat.

Propagule Pressure – A measure of the number of individuals of a species introduced to an area and the number of discrete release events: the higher the numbers, the greater the pressure.

Public Safety Risk Rank – Ranking derived from the Public Safety Risk Score, used to predict the relative risk posed to humans by captive or released individuals.

Quarantine Act – The *Quarantine Act 1908*, inclusive of subordinate legislation.

Regulated Live Specimen – Under the EPBC Act, a regulated live specimen is defined as a specimen that is a live animal or a live plant, and is not included in Part 1 of the Live Import List.

Relevant Authority – In this document, the term Relevant Authority shall mean instrumentalities of the Australian Government, state or territory government with legislative responsibility for the control of non-indigenous vertebrates.

Risk Analysis includes the processes of:

> *Risk assessment*: Process of identifying a hazard (source of potential danger or harm), estimating (in quantitative, semi-quantitative or qualitative terms) the likelihood of conversion of a hazard into actual harm and identifying potential damage and other undesirable outcomes.
>
> *Risk management*: Process of identifying, documenting and implementing measures that can be applied to reduce the level of risk and its consequence. Where the assessed risk is extreme, management of that risk may be by avoidance i.e. the risk may be negated by taking pre-emptive action such as excluding certain species from Australia or implementing sufficient risk management measures to reduce the potential risks to an acceptable level.
>
> *Risk communication*: Process by which information, opinions and processes regarding hazards and risks and their assessment and management are gathered from and communicated to potentially affected and interested parties prior to and during risk assessment and management, i.e. open exchange of information between risk assessors, risk managers and those who will be affected by the decisions taken.

SCoPI – Standing Council on Primary Industries, the successor to the Primary Industries Ministerial Council.

SPS Agreement – Agreement of the Application of Sanitary and Phytosanitary Measures, 1995.

Trade – Buying, selling or exchange of commodities (including non-indigenous vertebrates) for money or other commodities, or exchange by way of gift.

Travelling Collections – The containment (maintenance and holding) of species within itinerant facilities for a number of reasons including for exhibition.

Terms of Reference (Standard or Non-Standard) – In relation to Department of the Environment's procedures for amending the Live Import List as required under the EPBC Act, applicants must address the standard or non-standard Terms of Reference in preparing their draft environmental assessment report. The information provided is a component of the Department of the Environment assessment.

Vertebrate – animal with a skull surrounding a brain and a skeleton of cartilage or bone, including a backbone of vertebrae.

VPC – The Vertebrate Pests Committee, a technical sub-committee of the National Biosecurity Committee and the Primary Industries Standing Committee.

VPC List – VPC's List of Exotic Vertebrate Animals in Australia. A definitive list of the exotic vertebrates that have been assigned to threat categories and which can be legally kept under state and territory legislation.

VPC Threat Category – Ranking assigned to a vertebrate: for birds and mammals, derived from a combination of the Public Safety Risk Rank, Establishment Risk Rank, and Pest Risk Rank; for reptiles and amphibians a combination of the Establishment Risk Rank and an Extreme Pest Risk Rank.

VPC Extreme Threat Category – Extreme Threat species should not be allowed to enter Australia, nor be kept in any state or territory unless sufficient risk management measures exist to reduce the potential risks to an acceptable level. This level needs to be in line with the principles outlined in Section 2.1 and Section 2.2. These measures should also be agreed to by all relevant authorities who oversee the responsibility for the on-going management of the species. Using the precautionary approach, any species that has not been assessed previously should be considered to be in the Extreme Threat Category and should be treated accordingly, until a risk assessment is conducted.

VPC Serious Threat Category – Species in this category may be introduced and/or should be kept only in collections approved by the relevant state/territory authority as being primarily kept for (1) public display and education purposes, and/or for (2) genuine scientific research approved by the relevant state/territory authority, in line with the principles outlined in Section 4.2. NB: The term 'Serious' is interchangeable with the term 'High', which has

been used in some risk assessment documentation for vertebrates in Australia.

VPC Moderate Threat Category – Species in this category may be restricted to collections approved and registered by the relevant state/territory authority in line with the principles outlined in Sections 1.8.7 and 4.3. Additional factors may restrict the keeping of Moderate Threat species, such as conservation status and biosecurity considerations including animal welfare.

VPC Low Threat Category – Species in this category, relative to other species, are predicted, using the current risk assessment models to pose a low risk of becoming a problem for the environment, primary production or social values including public safety. The keeping of Low Threat species may not be restricted by these guidelines, although individual states/territories may impose restrictions necessary for protection within their jurisdictions as a precautionary measure in line with the principles outlined in Sections 1.8.7 and 4.4. Additional factors may restrict the keeping of Low Threat species, such as conservation status and biosecurity considerations including animal welfare.

Zoo – The containment (maintenance and holding) of species within facilities for a number of reasons including for conservation, exhibition or research. Facilities may be owned or run by relevant authorities or by private individuals or corporations.

WTO – World Trade Organisation.

ZAA – Zoo and Aquarium Association (formerly known as ARAZPA).

1 INTRODUCTION

1.1 General

The Vertebrate Pests Committee (VPC), a sub-committee of the National Biosecurity Committee (NBC), and the Primary Industries Standing Committee (PISC), produced these guidelines. The role and terms of reference of the VPC can be found at Appendix 1.

These guidelines were produced in response to requests from member state, territory and Australian Government agencies, and other non-government stakeholders to review and update the 2004 NRMSC – Guidelines for the Import, Movement and Keeping of Exotic Vertebrates in Australia; itself, an update of earlier editions published in 1991 and 1983 (Standing Committee on Agriculture 1991 and 1983); as part of a process of continual review and improvement which is intended to occur approximately every five years. This review was also instigated to address the outcomes of a risk assessment workshop attended by all jurisdictions held in Canberra in February 2009 (Henderson 2009).

These updated guidelines are consistent with two of the goals of the Australian Pest Animal Strategy (NRMMC 2007):

- Goal 1 Provide leadership and coordination for the management of pest animals.
- Goal 2 Prevent establishment of new pest animals.

Prevention and early intervention provide the most cost-effective means of dealing with pest problems. A strictly preventive approach would see no further import of species and, in the longer term, a reduction, through natural attrition, in the number of species and individuals kept in captivity in Australia. Such an approach was used in Australia for non-indigenous birds for many decades with a complete ban on live imports. This approach was unacceptable to many and may have contributed to incentives for illegal imports, so has been replaced with a risk analysis approach. This approach requires scientific and technical analysis of the risks involved, using the available tools and with sometimes very limited information about particular species, with risk management responses, including implementation of risk mitigation measures, consistent with the significance of the potential risk. Thus decisions are not based on ‘zero risk’ but rather on an ‘acceptable level of risk’ that is determined by scientific assessment and maintained at that level by the adoption of risk management and communication strategies.

The adoption of a policy of managed risk for the import (both into Australia and from one jurisdiction to another), movement and keeping of non-indigenous species has several benefits. It reduces the incentive for illegal import of live animals, with associated non-indigenous disease risks, and it enables legal import, keeping and movement of species that pose low risks of establishing free-living pest populations.

However, a likely consequence of the applications of the acceptable level of risk approach outlined in these guidelines is an increase in the types of non-

indigenous species kept in Australia, the number of individual animals kept and the number of collections. This in turn will increase the risk that some species will establish in the wild and have negative impacts on environmental, economic and social values, including public safety. Since risk assessment is an imperfect science and sometimes based on very limited information about the species, the acceptable level of risk approach and associated communication strategies should be conservative and where possible precautionary.

These guidelines are based on the legislation and policy in place at the date of publication, but may be used to inform future legislative reform, particularly at the state level. There is also ongoing work on development of policy on some aspects of vertebrate pest management and as a consequence they may be amended as considered appropriate by the VPC.

Members of the public can obtain further information about the import of non-indigenous vertebrates into Australia from the relevant Australian Government agencies. Information about the import from one jurisdiction to another, movement and keeping of non-indigenous vertebrates is available from the relevant state and territory or Australian Government agencies. Contact details for these organisations are listed in Appendix 2.

1.2 Species

These guidelines apply to vertebrates not indigenous to Australia but exclude non-indigenous fish[1]. The introduction of genetic material (genetically or otherwise modified) into species that may alter the level of risk posed by the above species is also within the scope of these guidelines (see Sections 3.3 and 3.4.4). These guidelines recommend that the introduction of genetic material into species that may alter the level of risk should be incorporated into assessment processes associated with the import of species into Australia.

1.3 Assessing the risk

These guidelines provide a nationally consistent framework for assessing the risk posed to environmental, economic and social values, including public safety, by species of non-indigenous vertebrates. The assessment is based (where possible) on:

- the danger posed by an individual animal
- the likelihood of establishment
- the consequences of establishment

The bird and mammal assessments result in the assignment of species into one of the four VPC Threat Categories: Extreme, Serious, Moderate or Low.

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1 Ornamental fish are managed under the national strategy – A strategic approach to the management of ornamental fish in Australia, through the Ornamental Fish Management Implementation Group (OFMIG). This group has representatives from all government jurisdictions as well as industry and hobby sector representatives and a member from the Aquatic Animal Health Committee.

However, while there is sufficient reliable information upon which to develop a quantitative method for assessing the risks of adverse impacts (public safety and pest risks) of new mammal and bird species (discussed in detail in Bomford 2003), the same is not true for reptiles and amphibians. This is because there has been limited research in this area, and because introductions of these exotic species have often coincided with other changes, such as habitat disturbance and destruction and the impacts of other introduced species (Bomford et al 2005). To date, only a quantitative model to assess establishment potential has been developed (Bomford et al 2005, 2009a, b; Bomford 2006, 2008).

The assessed reptile and amphibian establishment risk ranks are combined with an allocated extreme pest risk rank (based on the precautionary approach); resulting in the assignment of species into one of two VPC Threat Categories: Extreme, Serious.

These guidelines recommend a nationally consistent approach to the import, keeping and movement of non-indigenous vertebrates, as determined by the VPC Threat Category into which they are assigned.

1.4 Who will use these guidelines?

These guidelines will be used primarily by Australian Government, state and territory agencies, which have a direct responsibility for legislative control over the import, movement or keeping of non-indigenous vertebrates in Australia. To be as effective as possible in addressing the risks posed by non-indigenous vertebrates, their control requires a uniformly applied system for the import, movement and keeping of non-indigenous vertebrates to be adopted by the Australian Government and all states and territories.

These guidelines may be used by any relevant authorities to develop consistent policies and legislative controls for the management of vertebrate species, but individual states/territories can apply more conservative strategies if considered necessary for protection within their jurisdictions.

Some species are established pests and/or livestock, pet and farm animals widely kept in Australia and therefore relevant authorities may decide not to apply these guidelines to such species.

The guidelines will also be available to the public.

These guidelines should be used in conjunction with risk assessment models for establishment of exotic vertebrates in Australia and New Zealand (Bomford 2008) and earlier reviews and models (Bomford 2006, Bomford et al 2005 and Bomford 2003).

1.5 The need

Australia is particularly susceptible to the establishment of non-indigenous vertebrate populations and diseases because of its evolutionary isolation from other major land masses. Since European settlement, hundreds of non-indigenous vertebrates have been deliberately imported into Australia, both

legally and illegally, for pastoral production, transportation, pets, pest control or simply to make early settlers feel more ‘at home’ (Bomford and Hart 2002). In addition, a few have been imported accidentally, for example in cargo.

In Australia since European settlement, at least 84 species of introduced vertebrates have established wild populations, including 25 mammal species, 20 birds, four reptiles, one amphibian (Bomford 2008) and 34 freshwater fish (NRMMC 2006). Of other introduced species, seven birds, one mammal and two reptiles are established in the wild on Australian offshore islands (Bomford 2003). Fortunately, many more species introduced into the wild, including more than 50 species of birds, are reported by Bomford 2003 as having established but later having become extinct or were unsuccessful in establishing.

The species that have established cost hundreds of millions annually in losses to agricultural production, as well as contributing to environmental degradation and threatening the survival of many native species (Bomford and Hart 2002). The harmful effects of introduced non-indigenous vertebrates such as rabbits, foxes, feral goats, cane toads, starlings, mynas and sparrows cost many millions of dollars each year, and further millions are spent by landholders and

government authorities in attempts to control these pests. These species cause immeasurable harm to the natural environment as well as to primary industries. A conservative estimate of the direct economic impact (comprising the losses in agriculture, including horticulture, and the expenditures on management, administration and research) of birds, rabbits, wild dogs, mice, foxes and feral pigs is $743.5 million per annum (Gong et al 2009). Also, estimates of the environmental loss in Australia as a whole are not possible because of lack of data and so this annual total of $743.5 million underestimates the impact of invasive pests in Australia (Gong et al 2009).

Internationally, invasive species are now recognised as one of the most significant threats to biodiversity (Simons and De Poorter 2009). The estimated damage from invasive species worldwide totals more than US $1.4 trillion annually – five per cent of the global economy – with impacts across a wide range of sectors including agriculture, forestry, aquaculture, transportation, trade, power generation and recreation (Pimentel et al 2001 cited in Burgiel and Muir 2010). The Prime Minister’s Science and Engineering Innovation Council, at its May 2002 meeting, identified investment to limit the spread of pests, weeds and imported diseases as one of four key areas likely to return greatest impact in heading off the diminishing value of Australia’s natural systems and biodiversity.

These costs could have been avoided if the species had not been introduced and established in the first place. While efforts to control established pests continue, it is vital that the chances of new species becoming established are minimised. The Beale Review of 2008, ‘One Biosecurity; a working partnership’ (Beale et al 2008), recognised the need to manage the risk of introduction of pests and disease off-shore through scientific risk assessment whilst maintaining a vigilant border system and integrated post-border monitoring, surveillance and response.

Although many species may be kept with little risk of adding to Australia's pest problems, it is recognised that the widespread keeping and movement of some species would pose an unacceptable level of risk of them being released, either accidentally or deliberately. They could then become established and have negative impacts on environmental, economic and social values, including an unacceptable risk to public safety.

These guidelines outline a national approach within the context of Australian Government, state and territory legislation to minimise the risks posed by non-indigenous vertebrates.

1.6 Immediate outcomes

- Import, movement and keeping is informed by application of the 'Bomford' risk assessment processes and other processes as considered appropriate;

- Costs associated with multiple jurisdictions undertaking risk assessments for live import amendments can be minimised through an agreement for these risk assessments to be led by one state or territory, on behalf of other states and territories, allowing for the provision of better advice from all states and territories for less overall cost.

- The administering authorities for import into Australia are the Australian Government Department of Agriculture and the Australian Government Department of the Environment, with input from the states and territories on sufficient risk management measures to reduce the potential risks associated with import to an acceptable level which should be agreed to by all relevant authorities who oversee the responsibility for the on-going management of the species.

- Minimum risk management strategies are implemented as per Section 4 of these guidelines.

- Jurisdictions agree to manage risk in accordance with the principles and processes outlined in this document, but can apply more conservative strategies if considered necessary.

1.7 On-going expected outcomes

- Future assessments for import into Australia by Department of Agriculture and Department of the Environment will be informed by these guidelines, in a manner consistent with international trade and environmental obligations;

- Future import from one jurisdiction to another, and movement and keeping within states and territories will be informed by these guidelines;

- Risk assessment, using Bomford models and their successors as the national standard as agreed to by VPC, including a thorough and comprehensive examination of available information, consultation and

incorporation of reviewers comments; all by assessors with appropriate expertise;

- Applications to assess or review the threat of non-indigenous vertebrates will be handled through a timely, scientific and open process and based on the processes documented in these guidelines;

- Appeals against decisions on the level of threat from specific non-indigenous vertebrates will be handled in a formal process (including examination of new information as it becomes available), according to the legislative requirements of the relevant jurisdiction;

- Future legislation and policy development and/or amendments will be informed by these guidelines.

1.8 Where do these guidelines fit with the regulation of vertebrates under Australian Government, state and territory legislation?

1.8.1 The Australian Government

The Australian Government Department of Agriculture (Department of Agriculture) and the Australian Government Department of Environment (Department of the Environment) regulate the import of native and non-indigenous vertebrates into Australia.

Department of Agriculture Biosecurity develops new policy, usually through an import risk analysis (IRA), reviews existing quarantine policy on imports of animals and their products and manages quarantine controls at Australian borders to minimise the risks of non-indigenous pests and diseases entering the country. All imported animals must be accompanied by a Department of Agriculture permit (except for cats and dogs from New Zealand). This permit sets out conditions under which the quarantine risk posed by the species can be managed.

For species already kept in Australia, the entry of new genotypes may pose additional risks. The Australian Government and individual jurisdictions may decide to conduct a risk assessment of such new genotypes.

1.8.1.1 Regulation of imports – Australian Government Department of Agriculture

The *Quarantine Act 1908* (the Quarantine Act) is administered[2] by the Australian Government Department of Agriculture (Department of Agriculture). The Quarantine Act outlines measures to prevent or control the introduction, establishment or spread of diseases or pests that will or could cause significant damage to human beings, animals, plants, other aspects of the environment or economic activities.

[2] Human quarantine is administered by the Director of Human Quarantine within the Australian Department of Health.

The import risk analysis (IRA) process is science-based, open and transparent process, which provides for considerable industry and community consultation (including with trading partners). Once an IRA has been established for a group of species (such as primates, carnivores etc) then the import request needs to be managed through Department of Agriculture. A list of current and finalised IRAs, as well as the process followed in conducting an IRA is available from http://www.daff.gov.au/ba. Risk assessments are not usually conducted for species not currently listed by Department of Agriculture as suitable for importation.

The importation of live animals is prohibited unless an import permit has been issued by Department of Agriculture. Import permits are issued for commodities (including live animals) for which import conditions have been determined as a result of the IRA.

For the purposes of the Quarantine Act the term environment includes all aspects of the surroundings of human beings, whether natural surroundings or those created by human beings themselves, and whether affecting them as individuals or in social groupings.

The Quarantine Act requires the Director of Animal and Plant Quarantine, before making certain decisions, to request advice from the Environment Minister and to take the advice into account when making those decisions.

1.8.1.2 Regulation of imports – The Australian Government Department of Environment

The Australian Department of Environment (Department of the Environment) administers the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). Department of the Environment is responsible under the EPBC Act for assessing the environmental impact associated with proposals to import live specimens (see Appendix 3).

The EPBC Act establishes a list of specimens suitable for live import. The Live Import List comprises two parts:

- Part 1 comprises unregulated specimens that do not require a live import permit under the EPBC Act. The largely unrestricted list includes non-indigenous vertebrates from animal groups such as live domesticated animals, bony fishes (Osteichthyes), cartilaginous fishes (Chondrichthyes), and birds (Aves). Some freshwater fish may be subject to certain listed conditions such as minimum size limits.

- Part 2 comprises allowable regulated specimens that require a live import permit under the EPBC Act. The list includes certain species from those groups listed for Part 1, in addition to approved amphibians and reptiles and non-domesticated mammals. Imports of specimens from Part 2 of the list may also be subject to certain conditions.

The Live Import List is available at:
www.environment.gov.au/biodiversity/wildlife-trade/live/import-list

Amendment of the Live Import List (either the addition or removal of species or variation of conditions of import) can be made either by application or at the request of the Australian Government Minister for the Environment. New species may be added to the list only after their potential impacts on the environment have been fully assessed to the satisfaction of this Minister.

A decision to amend the list resides with the Minister. The Minister must consult with other Federal, state and territory Ministers as appropriate, and may consult other persons, prior to making a final decision. This is important as the ultimate responsibility to oversee the on-going management of the species after importation resides with the relevant authorities. The Minister may also review a decision within five years of making one. If approved, the amendment will be made public by instrument published in the Australian Government Gazette. The amendment must be tabled in both Houses of Parliament for a period of 15 sitting days and may be disallowed. If a disallowance motion was successful, then the species would remain a prohibited import.

The assessment to amend the Live Import List relates to a review of the potential environmental impact of the species and the potential to manage risk through import and holding restrictions, including the ability of the relevant authority to manage the appropriate risk management measures. The permitting system which approves the import of a specimen considers but is not limited to the likely impacts on biodiversity, including the conservation status of indigenous species and communities, the status of a species under the Convention on the International Trade in Endangered Species of Wild Fauna and Flora (CITES), animal welfare issues and the ability of the relevant authorities to manage the risks posed by a species and its progeny into the future.

1.8.1.3 Possession of illegally imported animals into Australia

The EPBC Act contains provisions that make it an offence for a person to be in possession of a live non-native specimen that was not lawfully imported or is progeny of specimens that were not lawfully imported (section 303GN). Accordingly, where an officer authorised under the EPBC Act has reasonable grounds to suspect that a person is in possession of a specimen, or progeny of a specimen, imported into Australia illegally, the authorised officer may seize that specimen. Generally a specimen will be considered to have been imported illegally unless:

- it is a specimen of a species listed on Part 1 of the “List of Specimens Suitable for Live Import” (EPBC Act). Part 1 – identifies specimens that do not require an import permit from Department of the Environment (and cannot include CITES specimens).

- the specimen is, or is progeny of, an animal imported under a valid permit issued under the EPBC Act or the *Wildlife Protection* (Regulation of Exports and Imports) *Act 1982* (the Wildlife Protection Act relates to imports between 1 May 1984 and 11 July 2001).

- the specimen is, or is the progeny of, an animal that was imported prior to 1 May 1984 (i.e. prior to the Wildlife Protection Act) and was imported in accordance with Customs and Quarantine Regulations.

In accordance with the Criminal Code, where there is a prosecution for an offence against s303GN the defendant bears an evidentiary burden in relation to certain matters. People needing information on the possession offence should contact the Department of the Environment (see Appendix 2 for contact details) and if concerned about their legal situation should seek legal advice.

Investigations into illegal imports into Australia will be led by the relevant authorities under the EPBC and/or Quarantine Acts.

Seized animals should be humanely euthanised unless they can be re-exported or re-housed within Australia. Animals can only be re-housed within Australia in exceptional circumstances. In the event that re-housing is an option, it can only be done with Department of the Environment approval and the process is undertaken in collaboration with the states or territories and in consultation with the Australasian Species Management Program Manager of ZAA. Animals may only be re-housed into facilities that can meet the minimum security measures detailed in Table 2.

1.8.2 States and territories

1.8.2.1 Regulation within Australia – state and territory authorities

Whilst the decision to amend the Live Import List resides with the Minister for the Environment, the Minister must consult with other Federal, state and territory Ministers as appropriate. This is important since after importation into Australia, the movement, keeping and trade of non-indigenous vertebrates and their subsequent generations will be a matter for the relevant state or territory Authorities. The authorities take into consideration any conditions placed on the species by the Australian Government at the time of listing.

The subsequent import (from one jurisdiction to another), movement and keeping within Australia of any non-indigenous vertebrate that has been imported into Australia in compliance with the EPBC Act and the Quarantine Act may require the importer/applicant to obtain written approval from Department of the Environment, Department of Agriculture and the relevant state or territory authority. The *Quarantine Act 1908* only applies to directly imported animals and is limited to the extent it can manage movement and keeping post-importation. In general, the Quarantine Act Department of the Environments not cover progeny of imported species. In addition to regulating imports, Department of the Environment has the capacity to set some conditions on the import permit on keeping and movement of specimens and progeny.

A list of species known to be legally kept under state or territory legislation is maintained by the VPC – see www.feral.org.au/list-of-exotic-vertebrate-animals-in-australia and Section 3.5.

1.8.2.2 Animals illegally imported from one jurisdiction to another, illegally kept animals and animals discovered in the wild

Investigations into illegal import from one jurisdiction to another, illegally kept animals and animals discovered in the wild will be led by the relevant state and/or territory authorities under the relevant legislation.

Animals should be humanely euthanised. In certain circumstances they can be re-exported or re-housed within Australia. In the event that re-housing is an option (e.g. CITES and IUCN species), it can only be done with the approval of the relevant authorities and in consultation with the Australasian Species Management Program Manager of ZAA. Animals may only be re-housed into facilities that can meet the minimum security measures in Table 2.

1.8.2.3 Collecting information from illegally imported, illegally kept animals and animals discovered in the wild

Information associated with illegally imported and illegally kept animals and animals discovered in the wild can be vital in preparedness and response planning and subsequent management. It is the responsibility of the relevant authority (where possible) to have the animal species identified and collect information on risk and pathways of spread. Relevant information may include measurements and descriptions; gender; genetic, reproductive and disease status and associations with pathways of spread or other law enforcement activities, including trace-forward and trace-back investigations.

1.8.2.4 Possession of legally kept animals

Legally kept mammals, reptiles and amphibians

These guidelines recommend a risk analysis approach for the keeping of non-indigenous vertebrates. There are additional factors that may restrict the keeping of Moderate or Low Threat species, such as conservation status and biosecurity considerations including animal welfare.

These guidelines also support the continued restriction of the private keeping (by members of the public) of non-indigenous vertebrates in line with the principles outlined in Sections 1.3 and 4 of these guidelines, particularly for mammals, reptiles and amphibians.

For species that are explicitly allowed to be kept by members of the public under state or territory legislation, these guidelines support their responsible ownership. The release of all non-indigenous species from effective human control should be prohibited.

Legally kept birds

Individual bird specimens and progeny that can be traced back to individuals shown to have been previously registered under the National Exotic Bird Registration Scheme (NEBRS) and those exempt from registration under NEBRS will be considered lawfully kept (except in cases where Department of the Environment has reasonable grounds to suspect individuals were illegally imported).

NEBRS ceased in 2002 and wildlife trade provisions were integrated into the EPBC Act, which included a possession offence. Under this provision a person is guilty of an offence if they possess a regulated live specimen or a specimen of a CITES-listed species unless lawfully imported. The defendant bears an evidentiary burden in relation to the specimens being lawfully imported.

On 11 October 2007, the Exotic Bird Record Keeping Scheme (EBRKS) was introduced to address the concerns held by the bird keeping industry regarding the adequacy of documentation kept by bird keepers to verify that specimens had been lawfully imported.

Additional objectives that the EBRKS aimed to address were to:

- reduce the risk of bird keepers acquiring illegally imported birds;
- reduce the risk of captive birds contracting exotic diseases spread by illegal wildlife trade; and
- to protect Australia's native wildlife from introduced pests and diseases.

The EBRKS encourages people who keep, breed or trade in exotic birds to keep appropriate records, both as a matter of good practice, and to conform to a responsible approach given the importance of controlling illegal trade and protecting Australia's biodiversity.

Good record keeping is promoted by the EBRKS in the event that a person comes under scrutiny relating to the possession of potentially illegally imported specimens or the progeny of such specimens.

Information about EBRKS is available at:
www.environment.gov.au/topics/biodiversity/wildlife-trade/exotic-non-native-animals/exotic-birds
Information about the 2007 Inventory of Exotic (non-native) Bird Species known to be in Australia is available at:
www.environment.gov.au/resource/2007-inventory-exotic-non-native-bird-species-known-be-australia

Individual states/territories can apply more conservative strategies, including prohibiting some bird species or requiring permits and/or border inspections for the keeping of other bird species, if considered necessary for protection within their jurisdictions.

Legally kept fish

Aquarium fish are widely kept as pets, but if they are dumped or released into the wild they can pose a serious threat to Australia's aquatic biodiversity. Releases of fish in the past have resulted in approximately 34 non-indigenous freshwater species having established populations in Australia, seriously affecting the biodiversity of our freshwater systems. The pathway for 22 of these species like weatherloach and goldfish, is thought to have been the ornamental fish industry (NRMMC 2006).

As a first step in addressing the risk of ornamental fish forming wild populations and impacting on natural plants and animals, the Natural Resource Management Ministerial Council (NRMMC) endorsed the national strategy - A Strategic Approach to the Management of Ornamental Fish in Australia (NRMMC 2006). The strategy was developed in close consultation with industry and other stakeholders and published by the (then) Department of Agriculture, Fisheries and Forestry (DAFF) in 2006. It discusses the potential for aquarium fish to become pests and makes seven main recommendations on managing and regulating their trade, including the creation of a national noxious species list.

An Ornamental Fish Management Implementation Group (OFMIG) has been created to progress the implementation of the strategy. This group has representatives from all government jurisdictions as well as industry and hobby sector representatives and a member from the Aquatic Animal Health Committee. The Department of Primary Industries and Regions, South Australia (PIRSA) currently performs the Secretariat function for OFMIG.

Whilst these guidelines exclude non-indigenous fish, it is recognised that mechanisms for a consistent approach to the import, movement and keeping of all non-indigenous vertebrates should be investigated.

2 PRINCIPLES

2.1 Serving the national interest

The desired outcome from managing the import, movement and keeping of non-indigenous vertebrates is to minimise potential damage to primary production, the environment and public safety resulting from the release or escape and establishment of wild populations of non-indigenous vertebrates in Australia.

These guidelines are consistent with the Australian Pest Animal Strategy (NRMMC 2007) and focus on managing the risks posed by vertebrate pests, by development of appropriate strategies to achieve this desired outcome.

The key principles of these guidelines are described further in the following sections.

2.1.1 Decisions are made in the public interest

Decisions on the import, keeping and movement of non-indigenous species are made in the public interest. Because of the threat posed by some species, the benefit derived from their keeping is clearly outweighed by the potential harm they would cause. The benefit to be gained from non-indigenous vertebrates being kept by members of the public in Australia should not be promoted over the public benefit of the species not being in Australia (or being kept in appropriate facilities here), due to their potential impacts on environmental, economic and social values, including public safety.

2.1.2 Transparent and equitable processes

In the public interest, decisions need to be transparent and equitable. Decisions also need to comply with relevant legislation and be consistent with international agreements and conventions to which Australia is a signatory. They also need to be defensible on risk assessment and risk management grounds at both the Australian Government and state and territory levels.

Under the EPBC Act, the Australian Government must consider all applications to amend the Live Import List on their own merits. Australian Government assessment processes for new live imports provide for public and other stakeholder consultation (including state and territory authorities) during the process to determine if a species is suitable for live import, and if so, the conditions under which the import can occur.

State and territory authorities must also consider all applications for the import (from one jurisdiction to another), movement and keeping of non-indigenous species within Australia, as appropriate in line with the principles outlined in Sections 1.3 and within relevant legislation. State and territory assessment processes allow for consultation with relevant stakeholders.

These guidelines clearly articulate the processes involved with assessing the risks associated with importing, moving and keeping non-indigenous vertebrate species. The assessment process is based on publicly available

information including the documented risk assessment models and risk management strategies.

The results of the risk assessment are open to appeal by stakeholders. Various formal appeals processes are available according to the authority whose decision is being appealed.

2.2 Consistency with international obligations

2.2.1 Maintenance of biological diversity

Australia is a signatory to the International Convention on Biological Diversity (CBD), which under Article 8 (h) states that:

"Each Contracting Party shall, as far as possible and as appropriate:
(h) Prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species."

In response to this article, the International Union for Conservation of Nature (IUCN) has developed guidelines - 'IUCN Guidelines for The Prevention of Biodiversity Loss Caused by Alien Invasive Species' (IUCN 2000) to prevent further losses of biological diversity due to the deleterious effects of alien invasive species. The intention is to assist governments and management agencies to meet their obligations under the 1992 CBD. These guidelines were approved by the 51st Meeting of the IUCN Council, Gland Switzerland, February 2000 and have been used as a guide in the development of this document.

Strategies being developed by the IUCN for implementation of these guidelines call for alien species that may become invasive to be prohibited entry under national legislation (e.g. Reaser and Waugh 2007, Kioke et al 2006 and McNeely et al 2001).

Precautionary approach

The CBD also offers decision-makers guidance based on the application of the precautionary approach to the protection of biodiversity. The convention recommends that where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimise such a threat. The CBD guiding principles on invasive alien species (see Decision VI/23 in COP 6 2002) are not binding, but there is an expectation that member states of the CBD will adhere to the principles, which include an ecosystem and hierarchical approach, the role of states, research and monitoring and education and awareness.

2.2.2 International Trade in Endangered Species

Australia is a party to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants Department of the Environments not threaten their survival. Although CITES is legally binding on the Parties – in

other words they have to implement the Convention – it Department of the Environments not take the place of national laws. Rather it provides a framework to be respected by each Party, which has to adopt its own domestic legislation to ensure that CITES is implemented at the national level.

2.2.3 World Trade Organisation – prevention of restrictions on trade

Australia is also a signatory to international agreements on trade and quarantine under the World Trade Organization (WTO), which supports international trade that Department of the Environments not involve unjustified or disguised trade barriers. The WTO was established, among other things, to "…seek to protect and preserve the environment …" in the "field of trade and economic endeavour". The agreement on the application of Sanitary and Phytosanitary Measures (the SPS Agreement) allows countries to apply measures to "limit other damage…from the entry [introduction], establishment or spread of pests". The SPS Agreement also requires that, in its assessment of risks, members take into account "relevant ecological and environmental conditions". In addition, the Agreement on Technical Barriers to Trade (the TBT Agreement) ensures that "no country shall be prevented from taking measures necessary for the protection of…the environment…".

It is important to recognise there is an apparent 'conflict' between the CBD and the SPS agreement, despite them sharing many common features. The CBD is guided by overarching principles such as the precautionary approach to protect biodiversity from invasive alien species and thus may entail imposing trade restraints, even in the absence of full scientific certainty. Yet the goal of the WTO through the SPS agreement, is to facilitate trade, and restraints must be underpinned by strong scientific evidence.

"Operational differences in the allocation of the burden of proof mean that under the CBD Guiding Principles uncertainties are decided against introducing alien species, while under the SPS agreement, uncertainties are decided in favour of permitting trade" (Riley 2008).

To address this apparent conflict, CBD Decision VIII/27 (COP 8 2006) recognises the need for further consideration of gaps and inconsistencies in the international regulatory framework. This decision requires the CBD to consult with the WTO and other organisations on how to address the lack of international standards covering invasive alien species, in particular animals, that are not pests of plants. For example, it urges parties to undertake certain actions in relation to pathways of spread and its implications on risk assessment processes.

2.3 Risk analysis approach

The probable costs and benefits of importing and keeping non-indigenous species in Australia are difficult to assess and quantify. First, there is seldom a complete body of biological information on a species. Second, scientific predictions are imprecise about the ecology and behaviour of a species in a new environment, in relation to the probability of establishment, eradication, management and the extent of damage caused.

Given these limitations, VPC has considered the range of scientific approaches that can be taken to assess and manage the risks associated with the import and keeping of non-indigenous vertebrates. The most valuable approach is to use published scientific information relating to the probability of establishment and the potential to have negative impacts on environmental, economic and social values, including public safety. A model has been developed from detailed studies of past introductions of non-indigenous species and the factors that affect establishment success and pest status of birds and mammals. However, the same cannot be said for reptiles and amphibians, and to date, only a quantitative model to assess establishment potential has been developed.

- Risk analysis is the process used to assess, manage and communicate the threat from non-indigenous vertebrates and has three processes:

- Assessment: Identifying a hazard (source of potential danger or harm) estimating (in quantitative, semi-quantitative or qualitative terms) the likelihood of conversion of a hazard into actual harm and identifying potential damage and other undesirable outcomes.

- Management: Identifying, documenting and implementing measures that can be applied to reduce the level of risk and its consequence. Where the assessed risk is extreme, management of that risk may include avoidance i.e., the risk may be negated by taking pre-emptive action such as excluding certain species from Australia, or applying restrictions to containment or to the purpose of the import, to ensure sufficient risk management measures exist to reduce the potential risks to an acceptable level in line with the principles outlined in Section 2.1 and Section 2.2. These measures should be agreed to by all relevant authorities who oversee the responsibility for the on-going management of the species.

- Communication: Information, opinions and processes regarding hazards and risks and their assessment and management are gathered from and communicated to potentially affected and interested parties prior to and during risk assessment and management i.e. open exchange of information between risk assessors, risk managers and those who will be affected by the decisions taken.

The following are simple communications principles that aim to deliver consistent messages about Extreme and Serious Threat animal management across all relevant authorities.

- Some animal species, should they be introduced/released into Australia or further increase in number, threaten one or more of the environment, economic activity, social values or human health.

- Everyone has a role to play – by working together, government, industry and the community can best protect Australia from Extreme and Serious Threat animals. We need your help. Report any unusual

animals to the Australian Government or your relevant state or territory authority.

- The earlier we detect Extreme and Serious Threat animals, the more likely we will be able to eradicate or take appropriate action for the least cost to taxpayers.
- The importation, keeping, breeding and trading of some animals is illegal and penalties apply.
- Be a responsible pet owner.
- Illegally kept or unwanted animals (including pets) should be handed into the Australian Government or your relevant state or territory authority. They must not be released into the wild. Some animals may be able to be re-housed.
- Ensure that animals are kept in secure facilities.

Raising public awareness of the threats some species may pose to Australia is vital. Relevant authorities are encouraged to collaborate with facilities and collections to develop signage and other appropriate extension materials for Extreme Threat species.

This document concentrates on risk assessment and risk management in the following chapters, using models for establishment of exotic vertebrates in Australia and New Zealand (Bomford 2008) and earlier reviews and models (Bomford 2006, Bomford et al 2005 and Bomford 2003), that incorporate risk factors that have a demonstrated significant correlation with the establishment of non-indigenous mammal, bird, reptile and amphibian populations (see Section 3 on Risk Assessment for further detail) whereby risk assessment is to be scientifically sound, rigorous and independent of the proponent.

The models for mammals and birds were developed from analyses of successful and failed introductions of non-indigenous mammals and birds to Australia. This was not possible for reptiles and amphibians because too few species have been introduced into Australia to determine factors correlated with successful establishment. Instead, establishment data from overseas was used, where reasonably large numbers of reptiles and amphibians have been introduced.

It is therefore important to recognise that risk assessment is an imperfect science and sometimes based on very limited information about the species, the acceptable level of risk approach and associated communication strategies should be conservative and where possible precautionary.

2.3.1 Risk analysis of non-indigenous vertebrates proposed for import into Australia

The requirements of both the EPBC Act and the Quarantine Act must be met before the importation of a new non-indigenous vertebrate is approved. Department of Agriculture and Department of the Environment have

complementary processes that meet the requirements of the EPBC Act (see Appendix 3) and the Quarantine Act and take into account these Guidelines and the risk assessment models for establishment of exotic vertebrates in Australia and New Zealand (Bomford 2008) and earlier reviews and models (Bomford 2006, Bomford et al 2005 and Bomford 2003). Potential risk management strategies and the positions of other Federal, state and territory Ministers as appropriate are taken into account for decisions on import into Australia.

2.3.2 Risk analysis of non-indigenous vertebrates already kept in Australia

After importation into Australia, the importation from one jurisdiction to another, movement, keeping and trade of non-indigenous vertebrates and their subsequent generations will be a matter for the relevant state or territory authorities. State and territory authorities agree to use these guidelines in managing the risks posed by non-indigenous vertebrates already in Australia. Approval to keep species that have been assigned to a threat category in accordance with these guidelines will be decided by the relevant authority in the state or territory in which the species will be kept.

These guidelines represent a national approach to minimising risk posed by all non-indigenous vertebrates, including those species already in Australia, those in captivity and those that have established wild populations. The process of risk assessment for species already in Australia should therefore be the same as for those species for which import permission is sought. Risk assessment of non-indigenous vertebrates already known to be in Australia that are not on the approved import list, would enable them to be placed in appropriate threat categories so that:

- Department of the Environment and Department of Agriculture can make decisions on whether to approve future importation of these species with knowledge of the threat potential posed by the species.
- State and territory authorities with responsibility for vertebrate pest management can develop appropriate uniform policies and legislative controls based on the agreed level of threat to environmental, economic and social values, including public safety.
- State and territory authorities using these guidelines, can implement uniform minimum control standards to manage the risk of keeping non-indigenous vertebrates based on their potential threat.

2.4 Beneficiary pays

All stakeholders have a duty of care to manage the risks posed by vertebrate pests: risk management is not the singular responsibility of government agencies.

Where risks cannot be avoided, the costs of managing those risks should be borne by those benefiting, i.e. the beneficiaries of non-indigenous vertebrates being in Australia should pay for the costs of assessing and managing the

associated risks, together with those benefiting from the risks being minimised. This principle should be incorporated into relevant legislation.

In addition to legislative controls, effective management of the risks will typically require an education and coordination framework which encourages stakeholder participation.

2.5 Animal welfare

These guidelines do not make specific recommendations in relation to animal welfare issues associated with the import, movement and keeping of non-indigenous vertebrates. Animal welfare is usually addressed under separate Australian Government, state and territory legislation. However, in setting down minimum standards and conditions for the keeping of non-indigenous vertebrates in high security facilities, it is recommended that all agencies show a duty of care by directing keepers to appropriate National and/or state or territory controls, guidelines and/or codes of practice which relate to animal welfare issues, including the 'Australian Animal Welfare Standards and Guidelines: Exhibited Animals'.

2.6 Future review and continual improvement of these guidelines

There is a continuing need for ongoing discussion and monitoring of these guidelines by the Australian Government and state or territory agencies. In accordance with the VPC terms of reference, the VPC provides the appropriate forum for this process. Review of the guidelines will be a standing agenda item of the VPC and the VPC Chair will instigate a review every five years, unless an earlier need is identified.

3 RISK ASSESSMENT

Risk assessment processes are the first step of a risk analysis approach. For importing and keeping non-indigenous vertebrates, they are important in reducing the likelihood of new species establishing wild populations in Australia and becoming pests.

Based on current levels of knowledge and ecological theory, no risk assessment system, quantitative, semi-quantitative or qualitative, will guarantee whether or not a particular non-indigenous vertebrate species would establish in Australia if released, and if it Department of the Environments what impact it will have (Aquatic Nuisance Species Taskforce 1996). The processes outlined by these

guidelines sets out the procedures to minimise the risks given judicious use of the available information and appropriate application of the precautionary approach.

There is always uncertainty in risk assessments, and these uncertainties can be divided into three types (Aquatic Nuisance Species Taskforce 1996):

1. Uncertainty of the process (methodology).
2. Uncertainty of the assessor(s) (human error).
3. Uncertainty about the organism (biological and environmental unknowns).

The goal in assessing risks is to reduce the levels of uncertainty as much as possible (Bomford 2008), and this has been done as part of the development of the various editions of these guidelines by:

1. supporting the development of risk assessment methodology based on robust scientific knowledge and statistical analyses of past introductions to minimise the first source of uncertainty;
2. recommendations on appropriate training and expertise of the assessors to minimise the second source of uncertainty, since the quality of the risk analysis will, to some extent, always reflect the quality of the individual assessor(s) (Aquatic Nuisance Species Taskforce 1996); and
3. recommendations on thorough and comprehensive information review, along with review of the assessment by scientists familiar with the species being assessed, to minimise the third source of uncertainty.

It was agreed by participants[3] at an Invasive Animals CRC workshop held 25-26 February 2009 that the Bomford *et al* models and their successors should be used as the national standard for assessing the invasive risk to Australia from exotic animals. The models are based on extensive literature review and data sets, producing a scientifically-based selection of criteria. They provide an evidence-based risk assessment to inform regulatory agencies.

3.1 Process

Risk assessment involves (Bomford 2003):

- identifying hazardous events (in this case the establishment of new non-indigenous vertebrate pest species in Australia).
- estimating the likelihood that such an event will occur.
- assessing the probable consequences if it Department of the Environments (Beer and Ziolkowski 1995 and Bomford 2003).

3.2 Assessment factors

Factors that will contribute to the risk of establishment of new non-indigenous vertebrates in Australia are the probability that (Bomford 2003):

1. An escape or release will occur (not included in assessment models.
2. Escaped or released individuals will cause harm to people, pets, livestock or native animals.
3. Escaped or released individuals will establish a free living population
4. A newly established population can be eradicated (not included in assessment models).
5. If eradication fails, non-indigenous populations of the species will cause economic, social or environmental harm, and the degree and types of such harm.

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[3] Representatives attended from the then Australian Government Department of the Environment, Water, Heritage and the Arts (DEWHA; from Exotic Species Regulation and Environmental Biosecurity) and Department of Agriculture, Fisheries and Forestry (from then Bureau of Rural Sciences, Biosecurity Australia and Sustainable Resource Management). Representatives from each state and territory government attended from agriculture/primary industry and environment portfolios. Participants also included members of the Vertebrate Pests Committee (VPC), Murray–Darling Basin Authority, Australasian Regional Association of Zoological Parks and Aquaria, and the IA CRC. New Zealand's Department of Conservation and Environmental Risk Management Authority were also represented.

Citation
Henderson, WR (2009). Workshop Proceedings: Risk assessment processes for import and keeping of exotic vertebrates in Australia. 25–26 February 2009, Canberra. Invasive Animals Cooperative Research Centre, Canberra.

It should be noted that not all factors, only the intrinsic characteristics of particular species, are dealt with by the assessment models.

The first of these factors will be determined by the conditions under which the species can be kept, which are dealt with by the risk management section of these guidelines (see Section 4). As such, it is not included in the risk assessment models. However, physical barriers cannot be completely proof against escapes or releases due to:

- natural disasters such as floods, cyclones, fires or earthquakes
- vandalism, terrorism, civil unrest or war
- wilful release (Bomford 2003).

The second and third factors will be partially determined by the management response following an escape or release as well as intrinsic characteristics of the species concerned, biotic and abiotic components of the environment into which the species is released or escapes and propagule pressure (the release of large numbers of animals at different times and places which enhances the chance of successful establishment). Hence, some of these issues are partially dealt with in the risk assessment models.

The fourth factor, the feasibility of eradication of all wild populations, is not included in the risk assessment models because assessing the probability of success is extremely difficult (Bomford 2003). Eradication is also rarely attempted, and while there have been many eradications of introduced vertebrates from islands, no campaign against any widely established introduced vertebrate species has ever been successful on any continent, despite numerous large-scale attempts and the huge potential benefits of success (Dahlsten 1986; Macdonald et al. 1989; Usher 1989; Bomford and O'Brien 1995, all cited in Bomford 2003).

The fifth factor will be determined by intrinsic characteristics of the species and by the attitudes and values of Australian society to a new invasive non-indigenous species. Hence, only the first issue is dealt with in the risk assessment models.

The risks involved with the introduction of vertebrate species to Australia have been assessed by analysing past successful and unsuccessful introductions of vertebrate species into Australia, and by reviewing published studies of establishment success and the consequences of establishment both in Australia and overseas. These risk factors have been used to develop the risk assessment models for establishment of non-indigenous mammals and birds in Australia and New Zealand, the 'Australian and New Zealand Bird and Mammal Models' (Bomford 2008) and earlier reviews and models (Bomford 2006 and Bomford 2003).

A species' VPC Threat Category is determined from three component Risk Ranks:

- Public safety risk – risk posed to public safety from captive or released individuals.
- Establishment risk – risk that escaped or released individuals will establish a wild population in Australia.

- Pest risk – risk an established population of the species will cause harm (become a pest).

However, it is not possible to do this for exotic reptiles and amphibians, because too few exotic species in these taxa have been introduced to Australia. Instead, a model to assess the risk of establishment for these taxa was developed based on exhaustive analyses of reptile and amphibian establishment data (Bomford et al 2009, 2005; Bomford 2008, 2006) for Britain, Florida and California, where reasonably large numbers of exotic reptiles and amphibians have been introduced. This Australian Reptile and Amphibian Model is based on the assumption that the results of these analyses will also apply to introductions of species in these taxa to Australia (Bomford et al 2005).

In addition, while there is sufficient reliable information upon which to develop a quantitative method for assessing the risks of adverse impacts (public safety and pest risks) of new mammal and bird species (discussed in detail in Bomford 2003), the same is not true for reptiles and amphibians. This is because there has been limited research in this area, and because introductions of non-indigenous species have often coincided with other changes, such as habitat disturbance and destruction and the impacts of other introduced species (Bomford et al 2005).

Two models are available to assign establishment risk ranks to reptiles and amphibians: the Australian Reptile and Amphibian Model and the Australian Bird and Mammal Model (stage B, questions B1-3) (Bomford 2008). The former is the preferred model for these guidelines. It is recommended to conduct assessments using both models, and if the results differ, use the higher Establishment Risk Rank for decision making, based on a precautionary approach (Bomford 2006).

3.2.1 Danger posed by individual animals

Individual escaped or released animals may be able to inflict significant damage or directly harm people if they are aggressive, large or if they have organs capable of inflicting harm, such as teeth, claws, spines, a sharp bill, or toxin-delivering apparatus and have a known history of attacking, injuring or killing people, or may carry disease or pathogens. While there is sufficient reliable information upon which to assess the danger posed by mammal and bird species, the same is not true for reptiles and amphibians because of limited research in this area (Bomford et al 2005).

3.2.2 Establishment success

Bomford 2008 outlines the key factors affecting the establishment success of birds, mammals, reptiles and amphibians. Common to all, successful species:

- were introduced or released more times (propagule pressure).
- had higher climate matches to the countries where they were introduced.
- were more likely to have established populations elsewhere.

Successfully established mammal species also have larger average world geographic range sizes Forsyth et al (2004) and Bomford et al (2009), and relative to failed species successful reptiles and amphibians are more likely to belong to a genus or family that has higher success rates elsewhere (Bomford et al 2005 and Bomford 2008). Additional factors potentially affecting establishment success are also discussed in Bomford 2008.

3.2.2.1 Propagule pressure

In addition to the species attributes listed above, the other factor that is strongly correlated with establishment success is the number of release events, the total number of individuals released, and the number of sites at which releases occur. These three variables, which collectively determine the level of propagule pressure, should be considered as key factors when managing the risk of exotic species establishing in Australia (Bomford 2008).

The likelihood of accidental or deliberate release can be expected to increase with the number of collections of a particular species in Australia, the number of individuals within those collections and the lack of adequately maintained security within those collections. The value of such collections to their owners and to others is also likely to be inversely related to their accidental or deliberate release.

Propagule pressure can be managed by restricting which species are kept in Australia, the number of collections holding the species, the number of individuals kept in each collection, and the security conditions for keeping species to reduce the probability of escapes and releases occurring. However, as documented above physical barriers cannot be completely eliminate escapes or releases due to natural disasters, vandalism, terrorism, civil unrest or war, or wilful release (Bomford 2003). The value of such collections to their owners and to others, and the community's attitude, is also likely to be inversely related to the accidental or deliberate release of animals.

Any changes to policy or management for exotic species that allow more species to be imported, or reduce restrictions on where exotic species can be kept or the numbers kept, are likely to increase the risk that more introduced species will establish wild populations in Australia (Bomford 2008).

Again, as it is the intrinsic characteristics of particular species that are dealt with by the risk assessment models, propagule pressure is not addressed.

3.2.3 Becoming a pest following establishment

Bomford (2003) reviewed the literature on the risk factors that could be used to predict whether new exotic mammals and birds would become pests if they established wild populations in Australia and presented a model for quantifying this risk. Bomford (2003) concluded that the following attributes may increase risk of adverse impacts, (with the caveat that it cannot be assumed that species without these attributes will not cause harm):

- being in a taxonomic group that is particularly prone to cause agricultural damage, has demonstrated detrimental effects on prey

abundance and/or that has caused habitat degradation or is likely to hybridise with native species
- having a large geographic range outside Australia
- if a carnivorous mammal (particularly if arboreal) or a mammal that is primarily a grazer or a browser
- using tree hollows for nests or shelter
- being an agricultural or environmental pest anywhere overseas
- having a good climate match between the species' overseas range and any areas in Australia where susceptible primary production industries are located, or where susceptible native species or communities occur that could be harmed if the species established
- being a potential vector or reservoir for diseases already present in Australia that could affect people, livestock, other domestic animals or native species
- having attributes that could cause damage to buildings, vehicles, infrastructure, equipment or ornamental gardens
- having attributes (for example toxin-delivering organs) or behaviour (commensalism) that could harm or annoy people.

Some species could also become a reservoir or vector for parasites or diseases that affect people. Each of these factors also increase the risk of adverse impacts.

For reptiles and amphibians, Bomford et al (2005) states that there is insufficient reliable knowledge of factors associated with becoming a pest following establishment to make the development of a quantitative model feasible. However, Bomford's 2008 review of factors associated with adverse impacts indicates that an increased risk is associated with exotic species that (again with the caveat that it cannot be assumed that species without these attributes will not cause harm):

- have adverse impacts elsewhere
- have close relatives with similar behavioural and ecological strategies that have had adverse impacts elsewhere
- are dietary generalists
- are predatory
- destroy or modify vegetation or otherwise cause major habitat changes
- have the potential to cause physical injury
- harbour or transmit diseases or parasites that are present in Australia
- have close relatives among Australia's indigenous reptiles and amphibians with which they could hybridise
- are known to have spread rapidly following their release into new environments

The two most important factors thought to be associated with increased risk of adverse impacts are: having adverse impacts elsewhere and occurring in high densities in the native or introduced range (Dr Mary Bomford-pers comm).

3.3 Hybrids

Inter or intra-specific hybrid animals may be considered for the import (both into Australia and from one jurisdiction to another), movement and keeping as a distinct animal entity in their own right by the Australian Government or state and territory authorities.

3.4 Assignment to VPC Threat Categories

3.4.1 Birds and mammals

For birds and mammals, the three risk ranks (risk to public safety, establishment risk and pest risk) are then used to assign bird and mammal species to one of four VPC Threat Categories: Extreme, Serious, Moderate or Low (see Table 1).

3.4.2 Reptiles and amphibians

In lieu of a model and/or sufficient information to be able to properly assess pest risk (and based on the precautionary approach), all reptiles and amphibian species are allocated an extreme pest risk rank.

For reptiles and amphibians, the assessed establishment risk rank is combined with an **allocated** extreme pest risk rank to assign the species to one of two VPC Threat Categories: Extreme and Serious. Using Table 1, reptiles and amphibians with an extreme, serious or moderate establishment risk rank are assigned to the Extreme VPC Threat Category. Reptiles and amphibians with a low establishment risk rank are assigned to the Serious VPC Threat Category.

It should be noted that information on public safety risks will be collected where possible, however the potential risks posed to humans by captive or released individuals will not affect the assigned threat category (as per Table 1).

3.4.3 If a species has not been assessed or if there is too little information

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 will be adopted, that is the species will be assigned to the Extreme VPC Threat Category (and treated accordingly), until it is assessed as belonging to another threat category.

3.4.4 Hybrids

It is unlikely there would be enough science to support the assessment for establishment likelihood or consequence for inter or intra-specific hybrid animals. In such cases, the establishment likelihood or consequence of the parent species may be utilised. Where there is too little information to be able to undertake a risk analysis of an inter or intra-specific hybrid animal, the precautionary approach will be adopted, that is the inter or intra-specific hybrid animal will be considered to be in the same VPC Threat Category as the higher threat category of its parent species.

3.5 List of non-indigenous vertebrates in Australia

Through the VPC, a definitive list of the non-indigenous vertebrates that have been assigned to threat categories and which can be legally kept under state and territory legislation (the VPC List) will be maintained. The non-indigenous species list will be the main reference source for relevant authorities on the import from one jurisdiction to another, movement and keeping of non-indigenous vertebrate animals in Australia.

All states and territories should take account of the resulting list of species in their respective legislation. Acceptance of the list of non-indigenous vertebrates by all states and territories will imply that any non-indigenous vertebrate (including inter or intra-specific hybrids) not listed in the Serious, Moderate or Low Threat categories is automatically in the Extreme Threat category and should not be brought into Australia or kept within the states and territories without the species being categorised and without full compliance with the *Quarantine Act 1908* and the *EPBC Act 1999*, unless following the principles outlined in Section 4.1. Acceptance of the list will also imply that state, territory and Australian governments will use it as a reference in controlling the import from one jurisdiction to another, movement and keeping of non-indigenous vertebrate animals.

Table 1. Assigning species to VPC Threat Categories (shaded cells relate to assignment of reptiles and amphibians to VPC Threat Categories based on an assessed establishment risk and an allocated pest risk of extreme) – adapted from Bomford 2008

Establishment Risk	Pest Risk	Public Safety Risk	VPC Threat Category (see definition in definitions, abbreviations and acronyms)	Implication for any proposed import into Australia	Implication for keeping and movement in Australia
Extreme	Extreme	Highly, Moderately or Not Dangerous	Extreme	Prohibited, unless sufficient risk management measures exist to reduce the potential risks to an acceptable level	Limited to those collections approved for keeping particular Extreme Threat species
Extreme	Serious	Highly, Moderately or Not Dangerous	Extreme		
Extreme	Moderate	Highly, Moderately or Not Dangerous	Extreme		
Extreme	Low	Highly, Moderately or Not Dangerous	Extreme		
Serious	Extreme	Highly, Moderately or Not Dangerous	Extreme		
Serious	Serious	Highly, Moderately or Not Dangerous	Extreme		
Moderate	Extreme	Highly, Moderately or Not Dangerous	Extreme		
Serious	Moderate	Highly, Moderately or Not Dangerous	Serious	Import restricted to those collections approved for keeping Serious Threat species	Limited to those collections approved for keeping particular Serious Threat species
Serious	Low	Highly, Moderately or Not Dangerous	Serious		
Moderate	Serious	Highly, Moderately or Not Dangerous	Serious		
Moderate	Moderate	Highly Dangerous	Serious		
Moderate	Low	Highly Dangerous	Serious		
Low	Extreme	Highly, Moderately or Not Dangerous	Serious		
Low	Serious	Highly, Moderately or Not Dangerous	Serious		
Low	Moderate	Highly Dangerous	Serious		
Low	Low	Highly Dangerous	Serious		
Moderate	Moderate	Moderately or Not Dangerous	Moderate	Import restricted to those collections approved for keeping Moderate Threat species	Limited to those collections approved for keeping particular Moderate Threat species
Moderate	Low	Moderately or Not Dangerous	Moderate		
Low	Moderate	Moderately or Not Dangerous	Moderate		
Low	Low	Moderately Dangerous	Moderate		
Low	Low	Not Dangerous	Low	Import permitted	May be limited to collections approved for keeping particular Low Threat species
Any value	Any value	Unknown	Extreme until proven otherwise	Prohibited, unless sufficient risk management measures exist to reduce the potential risks to an acceptable level	Limited to those collections approved for keeping particular Extreme Threat species
Unknown	Any value	Any value	Extreme until proven otherwise		
Any value	Unknown	Any value	Extreme until proven otherwise		
Unassessed	Unassessed	Unassessed	Extreme until proven otherwise		

4 RISK MANAGEMENT

The risks posed by non-indigenous vertebrates in Australia are best handled by integrated risk assessment, risk management (including appropriate mitigation measures) and communication (of both the risks and the ways of addressing them).

While the consequences of the escape and establishment of a species listed as of Extreme, Serious or Moderate Threat will be more harmful than for other species, the likelihood of escape and establishment may be much greater for species with a lower risk but which are kept much more widely under less stringent security. This is because most vertebrate species introduced into Australia will be under some form of management (for example, into zoos, or as agricultural livestock or as pets). However, given enough time, escape is almost inevitable from most managed populations. Often there is a lag between the establishment of a species and it becoming a pest, so future impacts should be considered.

According to Shine et al (2000), exotic species are routinely introduced to be kept in captivity for scientific, ornamental or recreational purposes. They state, once admitted to a new country there is no such thing as zero risk of escape or release. They further state that the deliberate or accidental release of pets and aquarium specimens is a serious problem (Shine et al 2000). The risk of escape will increase with the number of managed populations and with the lack of adequate security (Temple 1992, Long 1981). Thus all collections of non-indigenous vertebrates should be managed to minimise the risk of accidental or deliberate release and the release of all non-indigenous species from effective human control should be prohibited.

Table 2 is a guide for relevant authorities on the acceptable minimum level of security measures appropriate to each VPC Threat Category. The options for restricting breeding need to be relevant to particular species and the circumstances of the collection.

Due to decisions in the past, there are examples where Extreme Threat species are kept within Australia in circumstances that do not meet these acceptable minimum security measures. Such examples should be actively managed in the future, so as to meet these measures, in accordance with these guidelines or alternative strategies put in place to manage the potential consequences of not doing so.

Management of established pests and livestock

The established pests and livestock traditionally kept in Australia may be managed according to the VPC Threat Categories determined by these national guidelines if further establishment or escapes from captivity would compromise control measures. For example, if new genetic material was introduced that enabled the species to survive and thrive in environments where it was not currently a problem, then these guidelines may be applied.

Table 2. Examples of the minimum level of security appropriate for risk management for the import and keeping of non-indigenous vertebrates. This table is a summary only and readers are encouraged to familiarise themselves with the detail of Sections 4.1 to 4.6.

Risk Management Measure	Extreme Threat Category	Serious Threat Category	Moderate Threat Category	Low Threat Category
Nil import, unless sufficient risk management measures exist to reduce the potential risks to an acceptable level – should be agreed to by all relevant authorities who oversee the responsibility for the on-going management of the species	✓	-	-	-
Import only into facilities or collections meeting certain criteria and the restrictions of relevant state and territory authorities	✓	✓	✓	✓
Facility meets best practice standards for keeping of the species and standard of overall management acceptable to relevant state and territory authorities	✓	✓	✓	✓
High security facility or collection approved by the relevant state or territory authority on a case-by-case basis for keeping a particular Extreme Threat species	✓	-	-	-
Serious Threat species kept for: i. public display and education purposes approved by the relevant state or territory authority, ii. genuine scientific research approved by the relevant state or territory authority	-	✓	-	-
Facilities and collections containing species will be subject to approval by the relevant state or territory authority as meeting best practice for keeping of the species concerned	-	✓	✓	✓
States/Territories may impose any additional restrictions on acquisition and keeping of species	✓	✓	✓	✓
Breeding in zoos limited to CITES or IUCN-listed species under a population management plan endorsed by VPC to satisfy both biosecurity and conservation objectives	✓	-	-	-
Breeding controlled and monitored in zoos via annual reports to satisfy both biosecurity and conservation objectives	-	✓	✓	-
Non-breeding in research institutions and limited numbers – where breeding is required, it should be under a population management plan	✓	✓	-	-
Risk management policy to manage all internal threats to the security of captive animals	✓	✓	✓	-
Evaluation of environmental aspects/impacts so external threats minimised	✓	✓	✓	-
Security should be relevant to the species and adequate to prevent escape due to natural disasters	✓	✓	✓	-
Public/animal interactions limited	✓	✓	✓	-
Authorised handling restrictions/Appropriate expertise	✓	✓	✓	✓
Proprietors and key personnel should not have been found guilty of relevant offences	✓	✓	✓	✓
Bio-climatic site and proximity to suitable habitat restrictions	✓	✓	✓	-
Contingency plans for escapes	✓	✓	✓	-

Table 2 continued. Examples of the minimum level of security appropriate for risk management for the import and keeping of non-indigenous vertebrates. This table is a summary only and readers are encouraged to familiarise themselves with the detail of Sections 4.1 to 4.6.

Risk Management Measure	Extreme Threat Category	Serious Threat Category	Moderate Threat Category	Low Threat Category
Notification of movement of animals between facilities and trade under permit between states/territories	✓	✓	✓	✓
Individuals permanently identified or treated to allow for identification	✓	✓	✓	✓
Demonstrate long-term viability/contingency plan for relocation of animals	✓	✓	✓	-
Bonds, insurance or cost-recovery systems	✓	✓	-	-
Record keeping	✓	✓	✓	✓
Approval of system for carcass/egg/live young disposal	✓	✓	✓	-
Facility and collection must be available for inspection at any reasonable time	✓	✓	✓	-
Audits of facilities and collections	✓	✓	✓	✓
Maximum number of species and the sex listed on the licence, taking into account relevant factors	✓	✓	✓	-
Member of ZAA or equivalent professional body to abide by the body's "Code of Ethics", policies and procedures	✓	✓	-	-
Release of all non-indigenous vertebrates from effective human control prohibited.	✓	✓	✓	✓
Specimens seized or forfeited as a result of illegal or accidental introductions, where rehousing is not available, will be humanely euthanised	✓	✓	✓	✓
Meets animal welfare requirements - not a VPC restriction but would be required by other legislation and may be a pre-requisite to approval	✓	✓	✓	✓

4.1 Extreme Threat species

Such species should not be allowed to enter Australia, nor be kept in any state or territory unless sufficient risk management measures exist to reduce the potential risks to an acceptable level in line with the principles outlined in Sections 2.1, 2.2 and 3.4. These measures should be agreed to by all relevant authorities who oversee the responsibility for the on-going management of the species. Relevant authorities should provide appropriate written rationale for their positions. However, any facility or collection already containing Extreme Threat species should be subject to approval by the relevant state or territory authority on a case-by-case basis as meeting best practice standards for keeping of the species concerned and to standards acceptable to the appropriate jurisdictions. The keeping and movement of specimens in this category will also have to be conducted in compliance with any conditions placed on the species by Department of the Environment and Department of Agriculture at the time of import. This may include the following standards:

- Such species should only be kept in facilities and collections approved for a particular Extreme Threat species e.g. a facility and collection approved by the state or territory authorities for keeping the species. When assessing new applications for keeping particular Extreme Threat species, relevant authorities should consider whether facilities or collections have previously been approved or refused and/or whether authorisations to keep species have been granted, refused, suspended or revoked.

- Relevant authorities may impose a bond or other insurance-style system on collections or seek to recover costs from facilities to cover responses to escaped animals or business non-viability. In the development of these systems, relevant authorities should recognise the different levels of risks posed by the different sectors responsible for the keeping of non-indigenous vertebrates, as well as any other beneficiaries of non-indigenous vertebrates being in Australia.

- A Risk Management Policy that manages all internal threats to the continued confinement of captive non-indigenous vertebrates should be in place. These threats would include maintenance of the physical security of the facilities and collections and conditions for the handling and movement of animals.

- Evaluation of external threats to the facility so that they can be minimised. These would include natural threats (e.g. storm, flood and fire) and human threats (e.g. deliberate release or theft).

- Auditing and reviewing of the risk management processes as required by the relevant authority. Relevant authorities may impose both regular and/or random audits of facilities and collections and may seek to recover costs for the audit(s). Coordination of audits across all areas of biosecurity, including animal welfare is encouraged.

- Premises:
    - Security should be relevant to the species being kept. This must be adequate to prevent escape due to damage caused by a natural disaster.
    - The overall standard of management of the facility must be of a high level (ie meets the minimum security measures in Table 2) and acceptable to the relevant authorities.
    - Location of the facility should be suitable for security relevant to the species, that is wherever possible, the surrounding area should be a hostile environment for the welfare of the species (e.g. climatically or due to unsuitable habitat) and also acceptable to the relevant authorities.
    - The facility and collections must be available for inspection by authorities at any reasonable time.

- Keepers:
    - Should have demonstrated expertise with the species in question or similar species. Evidence of expertise in the form of written references from recognised reputable referees may be required. A program for maintaining the skill level of staff through training or other measures must be demonstrated to the relevant authority.
    - Should not have been found guilty of relevant offences under Australian Government, state or territory legislation relating to the import and keeping of animals.

- Other conditions:
    - Records (including species scientific and common name) of all introductions or acquisitions (including details of previous owners and sex of new animals), births (including sex of progeny), deaths, transfers or sales (including details of new owners) or any other changes in numbers are to be kept, with stock returns being provided on a regular basis to the relevant authority as required.
    - Where appropriate individual specimens should be microchipped, tagged, have a scale/hair/feather sample taken or otherwise treated to allow for identification.
    - The relevant authority must approve the system of carcass/egg disposal.
    - The maximum number of specimens and the sex may be listed on the permit or licence, taking into account security factors, fecundity, whether the species is endangered etc.
    - The facility should be able to demonstrate long term financial viability through a business plan or other forms of financial support, underwriting or guarantees.
    - There must be a general contingency plan for the relocation of animals should the decision be made to no longer maintain the collection.
    - A generic contingency plan must be written and in place, to handle the deliberate or accidental release of animals from the facility.
    - The facility should be a member of ZAA or equivalent professional bodies and abide by the body's "Code of Ethics", policies and procedures.

    - The facility should notify the relevant authority of any intended movement of animals outside of the facility.
    - Release of all non-indigenous vertebrates from effective human control is prohibited.
    - Public/animal interactions should be limited to animals that do not pose a danger to humans and must not compromise the security of the facility or collection. Proposed public interactions must meet the 'Australian Animal Welfare Standards and Guidelines: Exhibited Animals' and for moderately or highly dangerous animals, approval must be sought from the relevant state or territory authority. However, there should be acknowledgement that risk cannot be eliminated and the public needs to be advised of this.

- Species not currently kept in Australia may be granted import approval through Department of Agriculture and Department of the Environment importation controls for import into those collections meeting these criteria and the restrictions of any relevant state or territory authorities.

- Breeding:
    - Breeding will be controlled in zoos and limited to those species that are CITES listed or IUCN listed and subject to an appropriate population management plan to ensure breeding meets conservation objectives, such as an ZAA Captive Management Plan subject to VPC endorsement. The preferred position should be to manage numbers of such species to satisfy both conservation and biosecurity objectives, including animal welfare requirements. Other species may be considered on a case-by-case basis by VPC.
    - In research institutions approved by the relevant authority Extreme Threat species should be kept in non-breeding collections, with an appropriate distance maintained between such collections. Numbers of animals kept in each collection should be limited. Where breeding is required for research purposes, maximum numbers should be nominated under a population management plan. Where animal welfare considerations prevent these restrictions being applied, the species should not be kept in Australia.

- States/Territories will remain responsible for imposing any additional restrictions on acquisition and keeping of Extreme Threat species.

- Specimens seized or forfeited at or beyond border restrictions, as a result of illegal or accidental introductions will be assessed for their suitability for rehousing by the relevant authority and based on the principles outlined in Sections 1.8.3 and 1.8.5. Where suitable rehousing is not available specimens will be humanely euthanised.

- For an animal requiring a permit to be moved interstate, it will be necessary for the authority in the state or territory of origin to ensure that the intended recipient has an appropriate state or territory permit prior to taking possession. It is the responsibility of the holder of an animal to

ensure that they are compliant with Australian Government legislation relating to the possession of non-indigenous animals. (A special procedure applies to travelling animal collections – see section below.) A contact officer should be nominated in each state and territory to supply this information on permit holders and to provide ongoing liaison on other matters as required.

- It should be noted that animal welfare requirements are regulated under other legislation however may be a pre-requisite to approval.

4.2 Serious Threat species

Any facility or collection containing Serious Threat species will be subject to approval by the relevant state or territory authority as meeting best practice for keeping of the species concerned and as being primarily kept for:

- public display and education purposes.

- genuine scientific research approved by the relevant state or territory authority.

The import, keeping and movement of specimens in this category will also have to be done in compliance with any conditions placed on the species by Department of the Environment and Department of Agriculture at the time of import. This may include the following standards:

- When assessing new applications for keeping particular Serious Threat species, relevant authorities should consider whether facilities or collections have previously been approved or refused and/or whether authorisations to keep species have been granted, refused, suspended or revoked.

- Relevant authorities may impose a bond or other insurance-style system on collections or seek to recover costs from facilities to cover responses to escaped animals or business non-viability. In the development of these systems, relevant authorities should recognise the different levels of risks posed by the different sectors responsible for the keeping non-indigenous vertebrates, as well as any other beneficiaries of non-indigenous vertebrates being in Australia.

- A Risk Management Policy that manages all internal threats to the continued confinement of captive non-indigenous vertebrates should be in place. These measures would include maintenance of the physical security of the facilities and collections and conditions for the handling and movement of animals.

- Evaluation of external threats to the facility so that they can be minimised. These would include natural threats (e.g. storm, flood and fire) and human threats (e.g. deliberate release or theft).

- Auditing and reviewing of the risk management processes as required by the relevant authority. Relevant authorities may impose both regular

and/or random audits of facilities and collections and may seek to recover costs for the audit(s). Coordination of audits across all areas of biosecurity, including animal welfare is encouraged.

- Premises:
    - Security should be relevant to the species being kept. This must be adequate to withstand damage caused by a natural disaster.
    - The overall standard of management of the facility must be of a high level (ie meets the minimum security measures in Table 2) and acceptable to the relevant authorities.
    - Location of the facility should be suitable for security relevant to the species, that is wherever possible, the surrounding area should be a hostile environment for the welfare of the species (e.g. climatically or due to unsuitable habitat) and also acceptable to the relevant authorities.
    - The facility and collections must be available for inspection by authorities at any reasonable time.

- Keepers:
    - Should have demonstrated expertise with the species in question or similar species. Evidence of expertise in the form of written references from recognised reputable referees may be required. A program for maintaining the skill level of staff through training or other measures must be demonstrated to the relevant authority.
    - Should not have been found guilty of relevant offences under Australian Government, state or territory legislation relating to the import and keeping of animals.

- Other conditions:
    - Records (including species scientific and common name) of all introductions or acquisitions (including details of previous owners and sex of new animals), births (including sex of progeny), deaths, transfers or sales (including details of new owners) or any other changes in numbers are to be kept, with stock returns being provided on a regular basis to the relevant authority as required.
    - Where appropriate individual specimens should be microchipped, tagged, have a scale/hair/feather sample taken or otherwise treated to allow for identification.
    - The relevant authority must approve the system of carcass/egg disposal.
    - The maximum number of specimens and the sex may be listed on the permit or licence, taking into account security factors, fecundity, whether the species is endangered or rare.
    - The facility should be able to demonstrate long term financial viability through a business plan or other forms of financial support, underwriting or guarantees.
    - There must be a general contingency plan for the relocation of animals should the decision be made to no longer maintain the collection.
    - A generic contingency plan must be written to handle the deliberate or accidental release of animals from the facility.

- The facility should be a member of ZAA or equivalent professional bodies and abide by the body's "Code of Ethics", policies and procedures.
- The facility should notify the relevant authority of any intended movement of animals outside the facility.
- Release of all non-indigenous vertebrates from effective human control is prohibited.
- Public/animal interactions should be limited to animals that do not pose a danger to humans and must not compromise the security of the facility or collection. Proposed public interactions must meet the 'Australian Animal Welfare Standards and Guidelines: Exhibited Animals' and for moderately or highly dangerous animals, approval must be sought from the relevant state or territory authority. However, there should be acknowledgement that risk cannot be eliminated and the public needs to be advised of this.

- Species not currently kept in Australia may be granted import approval through Department of Agriculture and Department of the Environment importation controls for import into those collections meeting these criteria and the restrictions of any relevant state or territory authorities.

- Breeding:
  - Breeding will be controlled and monitored in zoos through detailed annual reporting such as the relevant authority's annual reporting system and/or a ZAA Captive Management Plan or the ZAA Regional Census and Plan. The preferred position should be to manage numbers of such species to maintain national viability of the species and to satisfy both conservation and biosecurity objectives, including animal welfare requirements.
  - In research institutions approved by the relevant authority, Serious Threat species should be kept in non-breeding collections, with an appropriate distance maintained between such collections. Numbers of animals kept in each collection should be limited. Where breeding is required for research purposes, maximum numbers should be nominated under a population management plan.

- States/Territories will remain responsible for imposing any additional restrictions on acquisition and keeping of Serious Threat species.

- Specimens seized or forfeited at or beyond border restrictions, as a result of illegal or accidental introductions will be assessed for their suitability for rehousing by the relevant authority and based on the principles outlined in Sections 1.8.3 and 1.8.5. Where suitable rehousing is not available specimens will be humanely euthanised.

- For an animal requiring a permit to be moved interstate, it will be necessary for the authority in the state or territory of origin to ensure that the intended recipient has an appropriate state or territory permit prior to taking possession. It is the responsibility of the holder of an animal to ensure that they are compliant with Australian Government legislation

relating to the possession of non-indigenous animals. (A special procedure applies to travelling animal collections – see section below). A contact officer should be nominated in each state and territory to supply this information on permit holders and to provide ongoing liaison on other matters as required.

- It should be noted that animal welfare requirements are regulated under other legislation, however may be a pre-requisite to approval.

4.3 Moderate Threat species

These guidelines recommend a risk analysis approach for the keeping of Moderate Threat species based on the principles outlined in Section 1.8.5.

Any facility or collection containing Moderate Threat species may be subject to approval by the relevant state or territory authority as meeting best practice for keeping of the species concerned.

States/Territories will remain responsible for imposing any additional restrictions on acquisition and keeping of Moderate Threat species.

The import, keeping and movement of specimens in this category will also have to be done in compliance with any conditions placed on the species by Department of the Environment and Department of Agriculture at the time of import. This may include the following standards:

- A Risk Management Policy that manages all internal threats to the continued confinement of captive non-indigenous vertebrates should be in place. These measures would include maintenance of the physical security of the facilities and collections and conditions for the handling and movement of animals.

- Evaluation of external threats to the facility so that they can be minimised. These would include natural threats (e.g. storm, flood and fire) and human threats (e.g. deliberate release or theft).

- Auditing and reviewing of the risk management processes as required by the relevant authority. Relevant authorities may impose both regular and/or random audits of facilities and collections and may seek to recover costs for the audit(s). Coordination of audits across all areas of biosecurity, including animal welfare is encouraged.

- Premises:
    - Security relevant to the species being kept. This must be adequate to withstand damage caused by a natural disaster.
    - The overall standard of management of the facility must be of a level acceptable to the relevant authorities, particularly if the species is being kept for conservation purposes.
    - Location of the facility should be suitable for security relevant to the species, that is wherever possible, the surrounding area should be a hostile environment for the welfare of the species (e.g.

climatically or due to unsuitable habitat) and also acceptable to the relevant authorities.
    - The facility and collections must be available for inspection by authorities at any reasonable time.

- Keepers:
    - Should have demonstrated expertise with the species in question or similar species. Evidence of expertise in the form of written references from recognised reputable referees may be required. A program for maintaining the skill level of staff through training or other measures must be demonstrated to the relevant authority.
    - Should not have been found guilty of relevant offences under Australian Government, state or territory legislation relating to the import and keeping of animals.
- Other conditions:
    - Records (including species scientific and common name) of all introductions or acquisitions (including details of previous owners and sex of new animals), births (including sex of progeny), deaths, transfers or sales (including details of new owners) or any other changes in numbers are to be kept, with stock returns being provided on a regular basis to the relevant authority as required.
    - Where appropriate individual specimens should be microchipped, tagged, have a scale/hair/feather sample taken or otherwise treated to allow for identification.
    - The relevant authority may approve the system of carcass/egg disposal.
    - The maximum number of specimens and the sex may be listed on the permit or licence, taking into account security factors, fecundity, whether the species is endangered etc.
    - The facility should be able to demonstrate long term financial viability through a business plan or other forms of financial support, underwriting or guarantees.
    - There must be a general contingency plan for the relocation of animals should the decision be made to no longer maintain the collection.
    - A generic contingency plan must be written to handle the deliberate or accidental release of animals from the facility.
    - The facility should notify the relevant authority of any intended movement of animals outside the facility.
    - Release of all non-indigenous vertebrates from effective human control is prohibited.
    - Public/animal interactions should be limited to animals that do not pose a danger to humans and must not compromise the security the facility or collection. Proposed public interactions must meet the 'Australian Animal Welfare Standards and Guidelines: Exhibited Animals' and for moderately dangerous animals approval must be sought from the relevant state or territory authority. However, there should be acknowledgement that risk cannot be eliminated and the public needs to be advised of this.

- Species not currently kept in Australia may be granted import approval through Department of Agriculture and Department of the Environment importation controls for import into those collections meeting these criteria and the restrictions of any relevant state or territory authorities.

- Breeding:
    - Breeding will be controlled and monitored in zoos through detailed annual reporting such as the relevant authority's annual reporting system and/or a ZAA Captive Management Plan or the ZAA Regional Census and Plan. The preferred position should be to manage numbers of such species to maintain national viability of the species and to satisfy both conservation and biosecurity objectives, including animal welfare requirements.

- Specimens seized or forfeited at or beyond border restrictions, as a result of illegal or accidental introductions will be assessed for their suitability for rehousing by the relevant authority and based on the principles outlined in Sections 1.8.3 and 1.8.5. Where suitable rehousing is not available specimens will be humanely euthanised.

- For an animal requiring a permit to be moved interstate, it will be necessary for the authority in the state or territory of origin to ensure that the intended recipient has an appropriate state or territory permit prior to taking possession. It is the responsibility of the holder of an animal to ensure that they are compliant with the Australian Government legislation relating to the possession of non-indigenous animals. (A special procedure applies to travelling animal collections – see section below). A contact officer should be nominated in each state and territory to supply this information on permit holders and to provide ongoing liaison on other matters as required.

- It should be noted that animal welfare requirements are regulated under other legislation, however may be a pre-requisite to approval.

4.4 Low Threat species

These guidelines recommend a risk analysis approach for the keeping of Low Threat species based on the principles outlined in Section 1.8.5.

- Any facility or collection containing Low Threat species may be subject to approval by the relevant state or territory authority as meeting best practice for keeping of the species concerned.

- States/Territories will remain responsible for imposing any additional restrictions on acquisition and keeping of Low Threat species.

- Auditing and reviewing of the risk management processes as required by the relevant authority. Relevant authorities may impose both regular and/or random audits of facilities and collections and may seek to recover costs for the audit(s). Coordination of audits across all areas of biosecurity, including animal welfare is encouraged.

- Premises:
    - The overall standard of management of the facility must be of a level acceptable to the relevant authorities, particularly if the species is being kept for conservation purposes.

- Keepers:
    - Should have demonstrated expertise with the species in question or similar species. Evidence of expertise in the form of written references from recognised reputable referees may be required. A program for maintaining the skill level of staff through training or other measures must be demonstrated to the relevant authority.
    - Should not have been found guilty of relevant offences under Australian Government, state or territory legislation relating to the import and keeping of animals.

- Other conditions:
    - Records (including species scientific and common name) of all introductions or acquisitions (including details of previous owners and sex of new animals), births (including sex of progeny), deaths, transfers or sales (including details of new owners) or any other changes in numbers are to be kept, with stock returns being provided on a regular basis to the relevant authority as required.
    - Where appropriate individual specimens should be microchipped, tagged, have a scale/hair/feather sample taken or otherwise treated to allow for identification.
    - The facility should notify the relevant authority of the movement of animals between outside the facility.
    - Release of all non-indigenous vertebrates from effective human control is prohibited.

- Species not currently kept in Australia may be granted import approval through Department of Agriculture and Department of the Environment importation controls for import, subject to any relevant state or territory restrictions.

- Specimens seized or forfeited at or beyond border restrictions, as a result of illegal or accidental introductions will be assessed for their suitability for rehousing by the relevant authority and based on the principles outlined in Sections 1.8.3 and 1.8.5. Where suitable rehousing is not available specimens will be humanely euthanised.

- For an animal requiring a permit to be moved interstate, it will be necessary for the authority in the state or territory of origin to ensure that the intended recipient has an appropriate state or territory permit prior to taking possession. It is the responsibility of the holder of an animal to ensure that they are compliant with the Australian Government legislation relating to the possession of non-indigenous animals. (A special procedure applies to travelling animal collections – see section below). A contact officer should be nominated in each state and territory to supply this information on permit holders and to provide ongoing liaison on other matters as required.

- It should be noted, meeting animal welfare requirements are not a VPC restriction but would be required by other legislation and may be a pre-requisite to approval.

4.5 Unassessed species

Any non-indigenous vertebrate species including inter or intra-specific hybrid entities either proposed for import or detected in the country, that has not been assessed previously will be considered to be in the Extreme Threat category and will be treated accordingly, until a risk assessment is conducted.

Species listed on the Live Import List (established under the EPBC Act) have been previously considered to be suitable for import, but this Department of the Environments not include inter or intra-specific hybrids of species on the Live Import List unless specifically listed. A permit to import a regulated live specimen under the EPBC Act cannot be granted unless the Minister or his delegate is satisfied that "the proposed import would not be likely to threaten the conservation status of a species or ecological community; or likely to threaten biodiversity". Satisfaction of these criteria would require consideration of pest potential.

4.6 Special procedures for travelling animal collections, including but not limited to short-term educational displays, circuses and film and television productions

- Relevant authorities should recognise the different levels of risks posed by travelling collections, particularly for short-term educational displays that are associated with permanent facilities and collections.

- Each travelling animal collection must be approved by the relevant authority in any state or territory entered, including the state or territory that it regards as its home base.

- Extreme Threat species should not be kept within travelling collections. Species in other threat categories should be restricted in accordance with biosecurity considerations including the ‘Australian Animal Welfare Standards and Guidelines: Exhibited Animals’.

- Travelling animal collections must seek advice from relevant states or territories when the collection intends to move from its home location or interstate, as the relevant state or territory may also need to approve the collection or facility and may refuse entry or impose additional restrictions. Each travelling animal collection should submit a detailed travel plan to the appropriate state or territory authority prior to the collection entering or moving through that state or territory.

- The travelling animal collection should submit returns, including species scientific and common name, births including sex of progeny, acquisitions (including details of previous owners and sex of new animals), deaths, sales (including details of new owners) or other changes in numbers of animals as required by the state or territory that it regards as its home base.

- Approval is conditional on the organisation providing an adequate level of security for its animal collection during performance, including any public interactions with the animals, static displays and while travelling.

- Public/animal interactions should be limited to animals that do not pose a danger to humans and must not compromise the security of the facility or collection. Proposed public interactions must meet the 'Australian Animal Welfare Standards and Guidelines: Exhibited Animals' and for moderately or highly dangerous animals, approval must be sought from the relevant state or territory authority. However, there should be acknowledgement that risk cannot be eliminated and the public needs to be advised of this.

- It is recommended that conditions relating to permits for non-indigenous vertebrates in the various threat categories for travelling animal collections be in accordance with those conditions required for permanent animal collections.

- Each state or territory authority has the right to inspect any travelling animal collection to ensure that it meets that state's standards and to compare numbers and types of animals kept with the details contained on regular returns to the relevant authority.

- Some states or territories may require an amount of money to be paid by a person or organisation keeping certain animals, as security for compliance with permitted conditions of keeping. This requirement should be left for each state or territory to administer as and when a travelling animal collection moves in or out of that state or territory.

- The import of live animals as part of a travelling animal collection is also regulated under the *EPBC Act 1999* and the *Quarantine Act 1908*. In order for an import permit to be granted for this purpose, specimens must appear on the list of specimens suitable for live import. Specimens not appearing on the list must be placed on the list before import approval will be given. Specimens being imported may also be subject to additional conditions on keeping and movement as outlined on the import permit.

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APPENDIX 1: ROLE AND TERMS OF REFERENCE OF THE VERTEBRATE PESTS COMMITTEE

Vision
Australia's biodiversity, agricultural assets and social values are secure from the impacts of vertebrate pest animals (from the Australian Pest Animal Strategy).

Purpose
To provide a national mechanism for identification, development and resolution of government policies on vertebrate pest animal issues on behalf of the National Biosecurity Committee.

Terms of Reference
Ensure an integrated and effective national approach to the prevention and management of vertebrate pest animal problems by reporting and advising the National Biosecurity Committee on the following matters:

1. Provide national policy and planning solutions to vertebrate pest issues.
2. Provide policy advice on priorities and report on performance in implementing the Intergovernmental Agreement on Biosecurity for national vertebrate pest animal issues
3. Oversee the implementation, evaluation and review of the Australian Pest Animal Strategy
4. Promote the adoption of the principles from the Australian Pest Animal Strategy by the community, government and key stakeholders at all levels
5. Develop, coordinate, communicate and deliver nationally consistent approaches for vertebrate pest animal management.

Modus Operandi
- Meet at least twice annually, face-to-face or by teleconference/ telepresence, and use teleconferences and working groups between sessions to progress business.
- Utilise a Secretariat to ensure the efficient and timely operation of the Committee.
- Develop an annual work program for endorsement by the National Biosecurity Committee.
- Develop, monitor and report on agreed implementation plans for the Intergovernmental Agreement on Biosecurity (as it relates to vertebrate pests) and Australian Pest Animal Strategy, including via national coordination where applicable.
- Report to National Biosecurity Committee at meetings and out of session.
- Facilitate the development, planning, coordination, implementation and monitoring of consistent national approaches to vertebrate pest management.
- Identify potential and emerging vertebrate pest problems and recommend appropriate actions
- Liaise with other national committees and external stakeholders.
- Work within the framework of the Intergovernmental Agreement on Biosecurity.

- Set up networks for emergency planning / action for vertebrate pest animal incursions.

Membership
Rotating Chair, Australian Government (Department of Agriculture and Department of the Environment) and all states and territories

Official Observers
Invasive Animals CRC, New Zealand Government, Animal Health Committee, Australian Bureau of Agricultural and Resource Economics and Sciences, CSIRO, Office of the Chief Veterinary Officer and Chair of the Pest Fish Working Group.

APPENDIX 2: CONTACT DETAILS FOR RELEVANT STATE AND TERRITORY AND AUSTRALIAN GOVERNMENT AGENCIES

AUSTRALIAN CAPITAL TERRITORY

Environment and Sustainable Development Directorate

Phone: 13 22 81

Email: environment@act.gov.au

Website: www.environment.act.gov.au

AUSTRALIAN GOVERNMENT

Department of Agriculture

Biosecurity

Live Animal Imports

Phone: +61 2 6272 4454

Email: animalimports@agriculture.gov.au

Website: www.daff.gov.au/biosecurity/import

Department of Environment

Environmental Biosecurity Section

Phone: +61 2 6275 9252

Email: exotic.species@environment.gov.au

Website:www.environment.gov.au/biodiversity/wildlife-trade/live/index.html

NEW SOUTH WALES

Department of Primary Industries

Biosecurity NSW

Phone: Invasive Species Hotline 1800 680 244

Email: invasive.species@dpi.nsw.gov.au

Website: www.dpi.nsw.gov.au

NORTHERN TERRITORY

Parks and Wildlife Commission

Permits Office

Phone: +61 8 8999 4814

Email: pwpermits@nt.gov.au

Website: www.parksandwildlife.nt.gov.au

QUEENSLAND

Department of Agriculture, Fisheries and Forestry

Biosecurity Queensland

Phone: 13 25 23

Email: callweb@dpi.qld.gov.au

Website: www.daff.qld.gov.au/biosecurity

SOUTH AUSTRALIA

Department of Primary Industries and Regions South Australia

Biosecurity SA

NRM Biosecurity Unit

Phone: +61 8 8303 9620

Email: nrmbiosecurity@sa.gov.au

Website: www.pir.sa.gov.au/biosecuritysa/nrm_biosecurity

TASMANIA

Department of Primary Industries, Parks, Water and Environment

Phone: +61 3 6165 4305

Email: wildlife.reception@dpipwe.tas.gov.au

Website: http://dpipwe.tas.gov.au/wildlife-management/management-of-wildlife

VICTORIA

Department of Environment and Primary Industries

Biosecurity Victoria

Phone: +61 3 136 186

Email: customer.service@depi.vic.gov.au

Website: www.depi.vic.gov.au

WESTERN AUSTRALIA

Department of Agriculture and Food

Pest and Disease Information Service

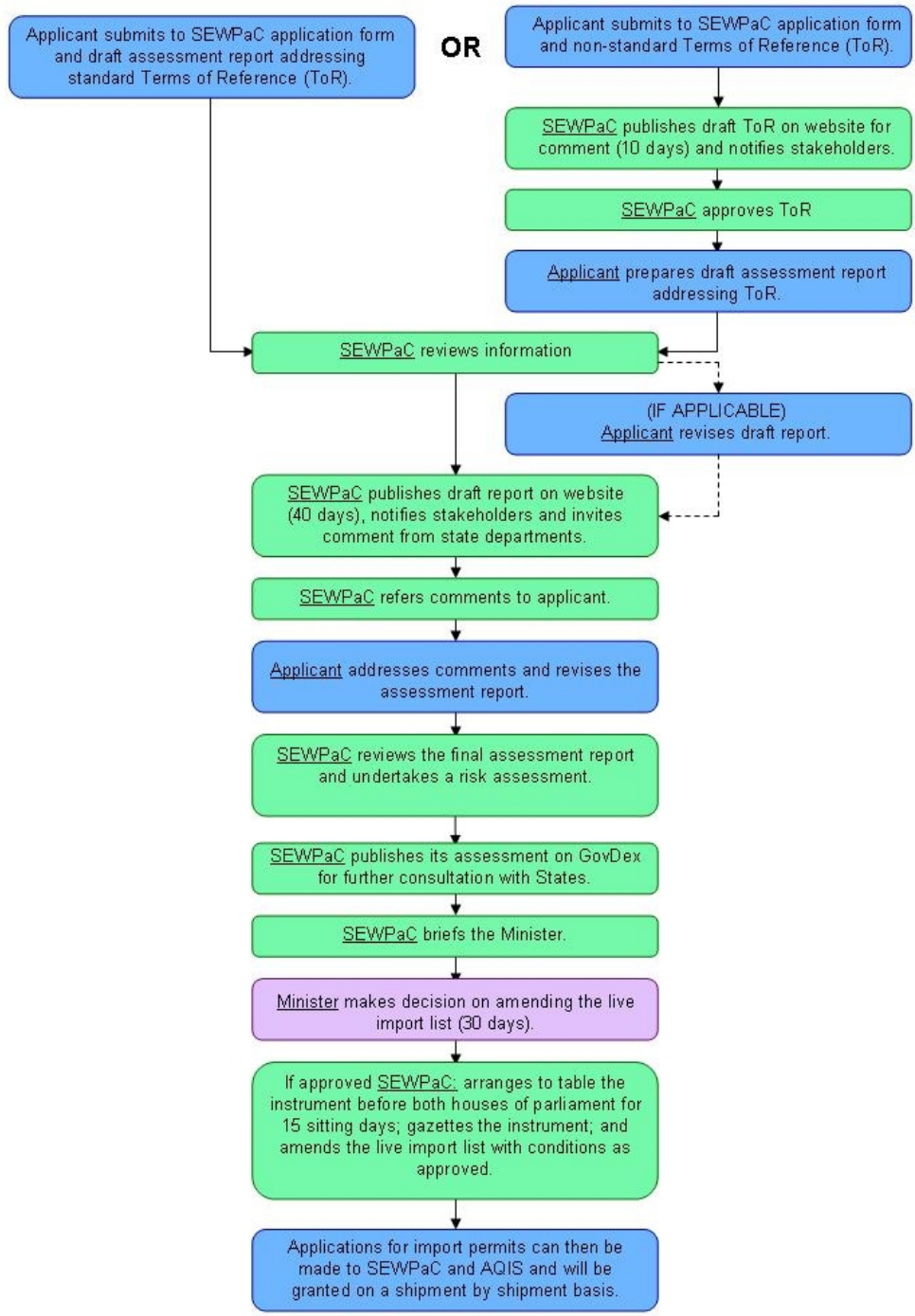
Phone: 1800 084 881

Email: info@agric.wa.gov.au

Website: www.agric.wa.gov.au

APPENDIX 3: PROCEDURE UNDER THE EPBC ACT FOR IMPORTING NON-INDIGENOUS VERTEBRATES INTO AUSTRALIA

This diagram illustrates the procedures for amending the Live Import List as required under the EPBC Act.



Note: SEWPAC is the former acronym for the Australian Government Department of Environment (Department of the Environment). Department of the Environment now performs the functions outlined for SEWPAC in the above diagram.