RISK ASSESSMENTS FOR EXOTIC REPTILES AND AMPHIBIANS INTRODUCED TO AUSTRALIA – Black-spined Toad (*Bufo melanostictus*) (Scheider, 1799)

Class - *Amphibia*, Order - Anura, Family - Bufonidae (Gray, 1825), Genus - *Bufo* (Laurenti, 1768) (ITIS Integrated Taxonomic Information System 2007, Catalogue of Life 2008)

Department of Agriculture and Food

GOVERNMENT OF WESTERN AUSTRALIA

Score Sheet

SPECIES: Black-spined Toad (*Bufo melanostictus*) Other common names include: Asian Common Toad; Asian Toad; Black-spectacled Toad; Common Sunda Toad; Javanese Toad; Indian Toad.		**Species Description –** Medium-sized toad, up to 9 cm length, although females may grow up to 15 cm. Colour various shades of grey, brown, or red, dorsal surface has warts tipped with black. Underside uniform dirty white, speckled with light brown on chin and throat. In breeding males, the throat is light orange or yellow, and they develop cornified pads on the inner side of the first and second fingers. Parotoid glands which release toxic skin secretions are present behind the ears (Obst et al 1988, Khan 2000). **Longevity –** Unknown (HAGR Human Ageing Genomic Resources 2006). **Status** – 1. Red List Category – Least Concern (LC) Rationale: Listed as 'Least Concern' on the IUCN Red List of threatened Species in view of its wide distribution, tolerance of a broad range of habitats, presumed large population, and because it is unlikely to be declining fast enough to qualify for a listing in a more threatened category (van Dijk et al 2004). 2. CITES listed Protection States: Not Listed (CITES 2007).
DATE OF ASSESSMENT: 24/06/2008 **Bird and Mammal Model Used: (Bomford 2008) using PC CLIMATE (Brown et al 2006, Bureau of Rural Sciences 2006)**		**The Risk Assessment Model** Models for assessing the risk that exotic vertebrates could establish in Australia have been developed for mammals, birds (Bomford 2003, Bomford 2006, 2008), reptiles and amphibians (Bomford et al 2005, Bomford 2006, 2008). Developed by Dr Mary Bomford of the Bureau of Rural Sciences (BRS), the model uses criteria that have been demonstrated to have significant correlation between a risk factor and the establishment of populations of exotic species and the pest potential of those species that do establish. For example, a risk factor for establishment is similarity in climate (temperature and rainfall) within the species' distribution overseas and Australia. For pest potential, the species' overseas pest status is a risk factor. The model was originally published in 'Risk Assessment for the Import and Keeping of Exotic Vertebrates in Australia' (Bomford 2003) available online http://www.daff.gov.au/brs/land/feral-animals/management/risk . This model used the Apple Mac application CLIMATE (Pheloung 1996) for climate matching. The risk assessment model was revised and recalibrated 'Risk Assessment for the Establishment of Exotic Vertebrates in Australia: Recalibrated and Refinement of Models'(Bomford 2006) and the climate application changed to PC CLIMATE software (Bureau of Rural Sciences 2006), available online at http://affashop.gov.au/product.asp?prodid=13506. The most recent publication (Bomford 2008) includes updated instructions for using the exotic vertebrate risk assessment models and an additional model for freshwater fish. A bird and mammal model for New Zealand has also been included. **Which models are being used for the assessments:** Birds and mammals have been assessed using the Australian Bird and Mammal Model (Bomford 2008), pp 16-28, including both versions of stage B, models 1 (4 factors) and 2 (7 factors). All reptiles and amphibians were assessed using three models; the Australian Bird and Mammal Model (Bomford 2008), including Model A, using 3 factors from stage B (pp 54-55), and Model B, using 7 factors from stage B (pp 20), and the Australian Reptile and Amphibian Model (Bomford 2008), p 51-53. The rational for using additional models for reptiles and amphibians is to compare establishment risk ranks of the three models for a precautionary approach. If the models produce different outcomes

		for the establishment potential of any reptile or amphibian, the highest ranked outcome should be used (Bomford 2008). **Climate Matching Using PC CLIMATE** Sixteen climate parameters (variables) of temperature and rainfall are used to estimate the extent of similarity between data from meteorological stations located in the species' world distribution and in Australia. Worldwide, data (source; worlddata_all.txt CLIMATE database) from approximately 8000 locations are available for analysis. The number of locations used in an analysis will vary according to the size of the species' distribution. Data from approximately 762 Australian locations is used for analysis. To represent the climate match visually, the map of Australia has been divided into 2875 grid squares, each measured in 0.5 degrees in both longitude and latitude. CLIMATE calculates a match for each Australian grid by comparing it with all of the meteorological stations within the species' distribution (excluding any populations in Australia) and allocating a score ranging from ten for the highest level match to zero for the poorest match. These levels of climate match are used in the risk assessment for questions B1 (scores are summed to give a cumulative score), C6, and C8. For a grid square on the Australian map to score highly, it must match closely all 16 climatic variables of at least one meteorological station in the species' distribution for each level of climate match. [The score for each grid is based on the minimum Euclidian distance in the 16- dimensional variable space between it and all stations in the species' distribution. Each variable is normalized by dividing it by its worldwide standard deviation.]
LITERATURE SEARCH TYPE AND DATE: NCBI, CAB Direct, MEDLINE, Science Direct, Web of Knowledge (Zoological Records, Biological Abstracts), SCIRUS, Google Search and Google Scholar 04/01/2008		
FACTOR	**SCORE**	
PROBABILITY ESCAPED OR RELEASED INDIVIDUALS WILL ESTABLISH FREE-LIVING POPULATION		
Model A: Using the first three factors/questions from stage B of the Australian Bird and Mammal Model (Bomford 2008) pp 54-55)		
B1. Degree of climate match between species overseas range and Australia (1–6)	4	*Climate Match Score = 1183 High climate match with Australia* [See above for information on climate matching.] Climate data from 811 locations (see species' worldwide distribution map) were used to calculate the CMS. Overseas distribution Southern Asia, with introduced populations occurring in Indonesia (see B2 and B3 for details).
B2. Exotic population established overseas (0–4)	4	*Exotic population established on an island larger than 50 000 km^2 or anywhere on a continent* **Sulawesi** – Introduced to north-eastern and south-west Sulawesi. Details of these are unknown (van Dijk et al 2004, Lever 2006). **Ambon** – Introduced to Ambon Island, Indonesia. No other information available (van Dijk et al 2004). **Papua New Guinea** – The date, site and source of the introduction to Papua New Guinea are unknown, but the toad is described as 'exceedingly abundant' in far western Papua. May have been introduced by the Health Department to control mosquitoes (unsubstantiated). possible multiple introductions elsewhere. The toad's distribution in the Bomberai Peninsula stretches from Amban Pantai north of Manokwari inland to Warmare and south down the coast of Oransbari and Ransiki, a total distance of about 80 km (van Dijk et al 2004, Lever 2006). **Andaman and Nicobar Islands** – It is suggested that the Islands are not part of the natural range of the species, and that they may have been transported by boats to many of the Andaman and Nicobar islands (Lever 1985). (van Dijk et al 2004) includes the islands as part of the natural range of the species. Because of this uncertainty, for this

		assessment the Andaman and Nicobar islands have been included as part of the natural range of the species. **Bali** –The black-spined toad is a recent immigrant to Bali (Church 1960). There is considerable evidence to suggest that the species has crossed over from Java and dispersed on Bali in comparatively recent times. It was not recorded there prior to 1930. However, there is no information as to whether this dispersal was natural or assisted by man. Bali included as introduced range of the toad (van Dijk et al 2004) however, (Lever 2006) includes Bali as part of the natural distribution. Because of this uncertainty, for this assessment Bali has been included as part of the natural range of the species. **Mauritius** – The toad is said to have been introduced to the island before 1837, where it had apparently died out prior to 1914 (Lever 2006).
B3. Overseas range size score (0–2) < 1 = 0; 1 – 70 = 1; >70 = 2	1	*Overseas range size between 1-70 million km^2, estimated at 7.41 million km^2. Includes current and past 1000 years, natural and introduced range.* This species occurs widely from northern Pakistan through Nepal, Bangladesh, India (including the Andaman and Nicobar Islands), Sri Lanka, southern China (south and east of Sichuan, including Taiwan, Hong Kong and Macau), Myanmar (Burma), Lao People's Democratic Republic, Vietnam, Thailand, Cambodia, Malaysia, Singapore, and Indonesia (Sumatra, Java, Borneo, Anambas Islands and Natuna Islands) (Church 1960, Zhao et al 1989, Inger and Lian 1996, Khan 2000, van Dijk et al 2004, Lever 2006, Hossain et al 2008). It has been recorded from sea level up to 1800 m (van Dijk et al 2004). The species has been introduced to Indonesia (see B2 for details).
ESTABLISHMENT RISK SCORE **SUM OF SCORE A (B1) + SCORE B (B2) + SCORE C (B3) (1-12)**	**9**	
Model B: Using the seven factors/questions from stage B of the Australian Bird and Mammal Model (Bomford 2008) pp 20)		
B4. Taxonomic Class (0–1)	1	*Amphibian* (ITIS Integrated Taxonomic Information System 2007).
B5. Diet score (0–1)	1	*Generalist with a broad diet of many food types* Diet includes a wide range of invertebrates, insects form the greater part. Spiders, crustaceans, millipedes and centipedes, slugs and earthworms are also taken. Feeding is confined to the ground (Berry and Bullock 1962, Sreeletha et al 1990). The tadpole larvae consume phytoplankton and zooplankton (Datta Munshi et al 1986).
B6. Habitat score - undisturbed or disturbed habitat (0–1)	1	*Can live in disturbed habitats* Very adaptable, mainly a species of disturbed lowland habitats, from upper beaches and riverbanks to human-dominated agricultural and urban areas. It is uncommon in closed forests, and is often associated with human habitation (van Dijk et al 2004). The toads often congregate under streetlamps to feed on insects attracted to the light (Khan 2000).
B7. Non-migratory behaviour (0–1)	1	*Non-migratory or facultative migrant in its native range OR unknown* No information found; probably non-migratory. The toad moves about with deliberate hops from place to place in search of insects on which it feeds (Khan 2000).
ESTABLISHMENT RISK SCORE **SUM OF B1-7 (1–16)**	**13**	
Australian Reptile and Amphibian Model (Bomford 2008, pp 51-53)		

Score A. *Climate Match Risk Score Degree (Sum of species' 4 scores for Euclidian match classes 7 - 10*	27.2	*CMRS = 100(759/2785)* Overseas distribution Southern Asia (ITIS Integrated Taxonomic Information System 2007).
Score B. *Has the species established an exotic population in another country? (0–30)*	30	*The species has established a breeding self-sustaining population in another country.* Exotic populations occurring in Indonesia (van Dijk et al 2004, Lever 2006).
Score C. *Taxonomic Family risk score (0–30)*	20	*Very high risk family (Bomford 2008)* Family Bufonidae, (ITIS Integrated Taxonomic Information System 2007).
ESTABLISHMENT RISK SCORE **SUM OF SCORE A + SCORE B + SCORE C (0 – ≥116)**	**77.2**	
PUBLIC SAFETY RISK RANK		
Risks to public safety posed by captive or released individuals (using the questions from stage A of the Australian Bird and Mammal Model (Bomford 2008, pp 17)		
A1. Risk to people from individual escapees (0–2) *Assess the risk that individuals of the species could harm people. (NB, this question only relates to aggressive behaviour shown by escaped or released individual animals. Question C11 addresses the risk of harm from aggressive behaviour if the species establishes a wild population).* *Aggressive behaviour, size, plus the possession of organs capable of inflicting harm, such as sharp teeth, claws, spines, a sharp bill, or toxin-delivering apparatus may enable individual animals to harm people. Any known history of the species attacking, injuring or killing people should also be taken into account. Assume the individual is not protecting nest or young.*	0	*All other animals posing a lower risk of harm to people (i.e. animals that will not make unprovoked attacks causing injury requiring medical attention, and which, even if cornered or handled, are unlikely to cause injury requiring hospitalisation* Small lethargic amphibian (Khan 2000).
A2. Risk to public safety from individual captive animals (0–2) *Assess the risk that irresponsible use of products obtained from captive individuals of the species (such as toxins) pose a public safety risk (excluding the safety of anyone entering the animals' cage/enclosure or otherwise coming within reach of the captive animals)*	1	*Moderate risk* Parotoid glands release toxic skin secretions; a study of the bioactive substances found it contained a sleep inducing factor. When rats were injected with the factor it produced no lethality up to a dose of 8 mg/kg but it decreased brain activity and induced sleep (Das et al 2000). The species is eaten locally in northern Thailand (van Dijk et al 2004). However, a report exists of two people who developed severe illness after eating the skin and eggs of a toad, which was suspected to be *Bufo melanostictus*. One boy died, and the other developed a toxicity-like syndrome with bradycardia and heart failure but survived. A survey of 16 Leo provincial hospitals suggested that toad poisoning occurs in at least six provinces (Keomany et al 2007).
PUBLIC SAFETY RISK SCORE **SUM OF A1 + A2 (0-4)**	**1**	
OTHER INFORMATION TO ASSESS PEST RISKS		
Checklist of factors associated with increased risks of adverse impacts of established species (Bomford 2008, pp 90-91) NB – an asterisk (*) denotes factors that have not been researched to the same degree as other factors, and were generally addressed using standard textbooks only		
FACTOR	**TICK IF YES**	

1. Has adverse impacts elsewhere *Impacts can be economic, environmental or social; impacts can be significant or subtle.*	✓	*Reported to be minor environmental pest in natural communities in at least one country or region of the world [score = 1, using scoring from Australian Bird and Mammal Model Q C5 (0-3)].* Possible effect by the introduced black-spine toad on the number of native amphibian species around Manokwari in Papua, as native species numbers appear limited, e.g. *Platymantis papuensis*, the black-spined toad could compete with it and may also prey on its eggs and young (Lever 2006). *Does not use tree hollows [score = 0, using scoring from Australian Bird and Mammal Model Q C4 (0, 2)].* Adults are terrestrial and during the day may be found under ground cover, such as rocks, leaf litter, and logs. Once a suitable place is selected, it is permanently shared with several toads (Khan 2000, van Dijk et al 2004). Breeding occurs in still and slow-flowing rivers, as well as temporary and permanent ponds and pools (van Dijk et al 2004). *No reports of damage to crops or other primary production in any country or region [score = 0, using scoring from Australian Bird and Mammal Model Q C7 (0-3)].* *Very low risk of harm or annoyance to the public posed by a wild population [score = 1, using scoring from Australian Bird and Mammal Model Q C11 (0-5)].* A lethargic, timid amphibian (Khan 2000). The toad produces toxic skin secretions that have an offensive taste to deter predators. A small amount of the substance can sting human eyes (National Geographic 2002). (see A2 for further information) Zoonoses: Many amphibians carry *Salmonella* bacteria in their intestinal tract that are easily spread to humans however transmission from amphibians to humans occurs through ingestion of the bacteria; simply touching or handling an infected animal will not result in transmission. Overall, reptile and amphibian contacts are estimated to account for around 74,000 (6%) of the approximately 1.2 million *Salmonella* infections that occur each year in the United States (Mermin et al 2004). Risk of disease transmission from populations of the black-spined toad established in the wild is very low.
*2. Has close relatives with similar behavioural and ecological strategies that have had adverse impacts elsewhere **	✓	One close relative that has had adverse impacts elsewhere is the Cane Toad (*Bufo marinus*). Other members of the genus *Bufo* have also established exotic populations (Lever 2006).
3. Is dietary generalist	✓	Diet includes a wide range of invertebrates, insects form the greater part. Spiders, crustaceans, millipedes and centipedes, slugs and earthworms are also taken. Feeding is confined to the ground (Berry and Bullock 1962, Sreeletha et al 1990). The tadpole larvae consume phytoplankton and zooplankton (Datta Munshi et al 1986).
*4. Stirs up sediments to increase turbidity in aquatic habitats **		No information found (Lever 2006).
*5. Occurs in high densities in their native or introduced range **	✓	In Papua New Guinea, the species has been described as 'exceedingly abundant' (Lever 2006).
6. Harbours or transmits diseases or parasites that are	✓	Potential carrier of Chytridiomycosis (Schumacher 2006).

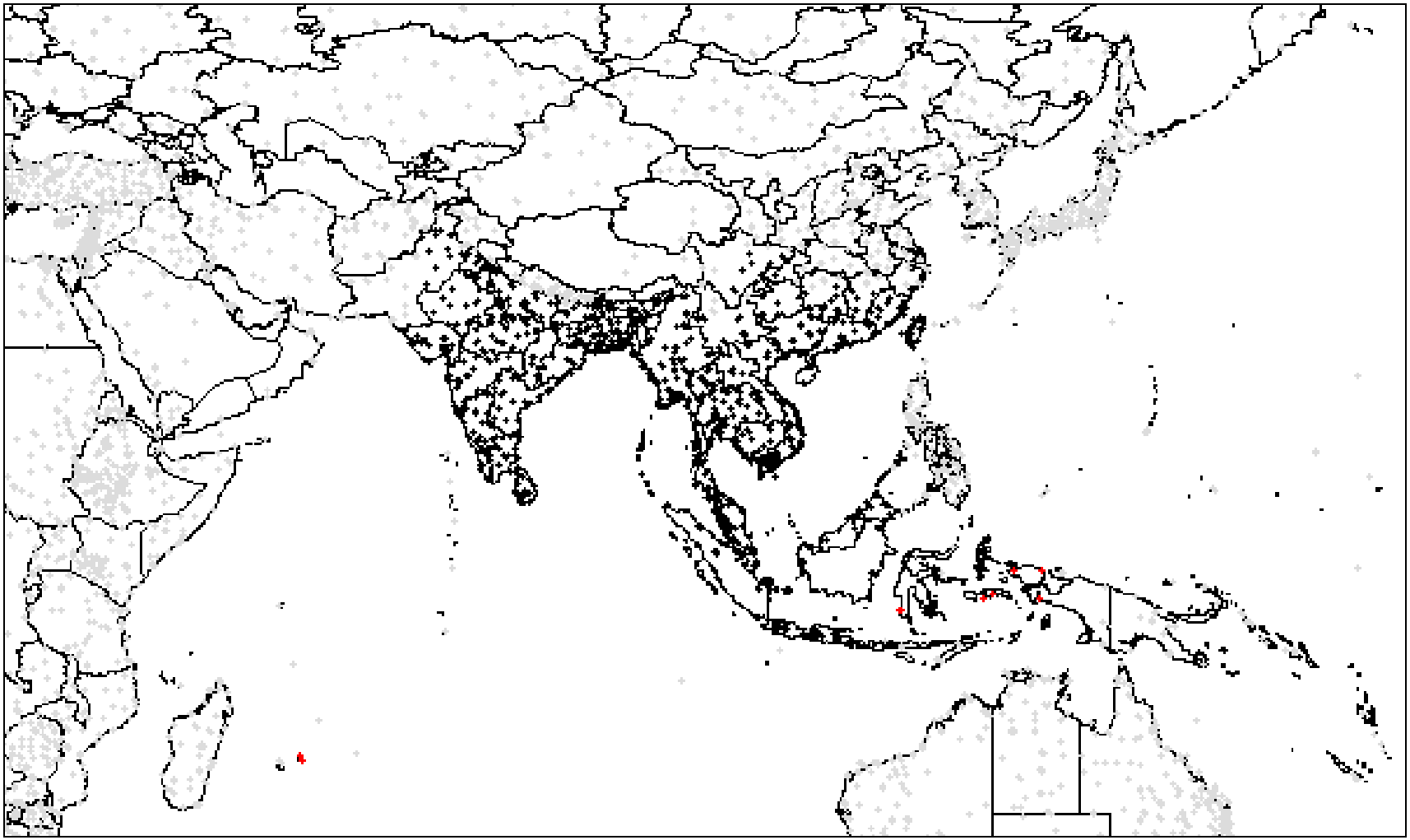
*present in Australia **		
7. Has close relatives among Australia's endemic reptiles and amphibians		No Australian species in the family Bufonidae or genus Bufo (Catalogue of Life 2008; Cogger 2000).
*8. Is known to have spread rapidly following their release into new environments **		No information found (Lever 2006).
9. Is predatory	✓	Diet includes a wide range of invertebrates, insects form the greater part. Spiders, crustaceans, millipedes and centipedes, slugs and earthworms are also taken. Feeding is confined to the ground (Berry and Bullock 1962, Sreeletha et al 1990). The tadpole larvae consume phytoplankton and zooplankton (Datta Munshi et al 1986).
Factors	**1,**2,3,**5**,6, 9	
Susceptible native Australian species (using question C6 from the Australian Bird and Mammal Model, Bomford 2008, pp 22-23)		
C6. Climate match to areas with susceptible native species or communities (0-5) *Identify any native Australian animal or plant species or communities that could be susceptible to harm by the exotic species if it were to establish a wild population here.*	**5**	*One or more susceptible native species or ecological communities that are listed as vulnerable or endangered under the Australian Government* Environment Protection and Biodiversity Conservation Act 1999 *has a restricted geographical range that lies with the mapped area of the highest six climate match classes for the exotic species being assessed. [score = 5, using scoring from Australian Bird and Mammal Model Q C6 (0-5)].* Reference for all vulnerable or endangered species and communities (status noted in bold) (Dept of the Environment Water Heritage and the Arts 2008) . Reference for all native frog species (Cogger 2000). Susceptible Australian native species or natural communities that could be threatened include: **Frogs: Vulnerable –** Wallum Sedge Frog (*Litoria olongburensis*), Stuttering Frog (*Mixophyes balbus*), Magnificent Brood Frog (*Pseudophryne covacevichae*), Kroombit Tinker Frog (*Taudactylus pleione*) **Critically endangered** – Armoured Mistfrog (*Litoria lorica*) and Mountain Mistfrog (*L. nyakalensis*) **Invertebrates: Vulnerable** – Bathurst Copper Butterfly (*Paralucia spinifera*) **Endangered –** Gove Crow Butterfly (*Euploea alcathoe enastri*), land snail (*Mesodontrachia fitzroyana*), moth (*Phyllodes imperialis*) **Critically endangered –** Boggomoss Snail (*Adclarkia dawsonensis*), Mitchell's Rainforest Snail (*Thersites mitchellae*) **Communities:** No listed vulnerable or endangered ecological communities likely to be at risk. **AND** *The species has more than 100 grid squares within the highest four climate match classes, that overlap the distribution of any susceptible native species or ecological communities* **Frogs:** Ornate Burrowing Frog (*Limnodynastes ornatus*), Northern Snapping Frog (*Cyclorana australis*), Green Tree Frog (*Litoria caerulea*), Bumpy Rocketfrog (*L. inermis*), Roth's Tree Frog (*L. rothii*), Desert Tree Frog (*L. rubella*).
Susceptible Australian primary production (using question C8 from the Australian Bird and Mammal model; Bomford 2008 pp 23-25)		
C8. Climate match to susceptible primary production (0–5) *Assess Potential Commodity Impact Scores for each primary production commodity listed in Table 9, based on species' attributes (diet, behaviour,*	0	*Score = 0* See Commodity Scores Table – species does not have attributes making it capable of damaging any of the primary production commodities.

ecology), excluding risk of spreading disease which is addressed elsewhere.		
SUMMARY OF RESULTS		
ESTABLISHMENT RISK RANKS – RISK OF ESTABLISHING A WILD POPULATION		
MODEL A: USING THE FIRST THREE FACTORS/QUESTIONS FROM STAGE B OF THE AUSTRALIAN BIRD AND MAMMAL MODEL (BOMFORD 2008) PP 54-55) ≤ 4 = LOW ESTABLISHMENT RISK; 5-7 = MODERATE ESTABLISHMENT RISK; 8-9 = SERIOUS ESTABLISHMENT RISK; 10-12 = EXTREME ESTABLISHMENT RISK	**9**	**SERIOUS**
MODEL B: USING THE SEVEN FACTORS/QUESTIONS FROM STAGE B OF THE AUSTRALIAN BIRD AND MAMMAL MODEL (BOMFORD 2008) PP 20) ≤ 6 = LOW ESTABLISHMENT RISK; 7-11 = MODERATE ESTABLISHMENT RISK; 12-13 = SERIOUS ESTABLISHMENT RISK; ≥ 14 = EXTREME ESTABLISHMENT RISK	**13**	**SERIOUS**
AUSTRALIAN REPTILE AND AMPHIBIAN MODEL (BOMFORD 2008, PP 51-53) ≤ 22 = LOW ESTABLISHMENT RISK; 23-60 = MODERATE ESTABLISHMENT RISK; 61-115 = SERIOUS ESTABLISHMENT RISK; ≥116 = EXTREME ESTABLISHMENT RISK	**77.2**	**SERIOUS**
HIGHEST ESTABLISHMENT RISK RANK (When establishment risk ranks differ between the models, the highest ranked outcome is used, (Bomford 2008).		**SERIOUS – ENDORSED BY VPC**
PUBLIC SAFETY RISK RANK AUSTRALIAN BIRD & MAMMAL MODEL, STAGE A (BOMFORD 2008, PP 17) A = 0 = NOT DANGEROUS; A = 1 = MODERATELY DANGEROUS; A ≥ 2 = HIGHLY DANGEROUS	**1**	**MODERATELY DANGEROUS**
Median number of references for Establishment Risk and Public Safety Risk, for all amphibians assessed by (Massam et al 2010) (n=11)		15, 1

Total number of references for this species		12 – less than the median number of reptile references were used for this aspect of the assessment, indicating an increased level of uncertainty. 2 - more than the median number of reptile references were used for this aspect of the assessment, indicating a decreased level of uncertainty
DAFWA THREAT CATEGORY - assigned for this study **(Public Safety + ERR) + use of the precautionary approach (when Prelim. Threat Ranking Low or Moderate)**		**SERIOUS – NOT ENDORSED BY VPC**
OTHER INFORMATION TO ASSESS PEST RISKS		
CHECKLIST OF FACTORS ASSOCIATED WITH INCREASED RISKS OF ADVERSE IMPACTS OF ESTABLISHED SPECIES **(BOMFORD 2008, PP 90-91) (0-9)**	**1**,2,3,**5**, 6,9	
AUSTRALIAN SPECIES POTENTIALLY AT RISK AUSTRALIAN BIRD & MAMMAL MODEL, Q. C6 (BOMFORD 2008, PP 22-23) (0-5)	**5**	
AUSTRALIAN PRIMARY PRODUCTION POTENTIALLY AT RISK AUSTRALIAN BIRD & MAMMAL MODEL, Q. C8 (BOMFORD 2008, PP 23-25) (0-5)	0	
ALTERNATIVE THREAT CATEGORY - assigned for this study **(Public Safety + ERR) + arbitrary increase of one rank (based on presence of adverse impact factors 1 or 5, or maximum scoring for predicted effects on Australian species or primary production)**		**EXTREME – NOT ENDORSED BY VPC**
Median number of references for Establishment Risk, Public Safety Risk and Overseas Environmental and Agricultural Adverse Impacts, for all amphibians assessed by (Massam et al 2010) (n=11) Total number of references for this species		19 15 – less than the median number of amphibian references were used for this assessment, indicating an increased level of uncertainty.

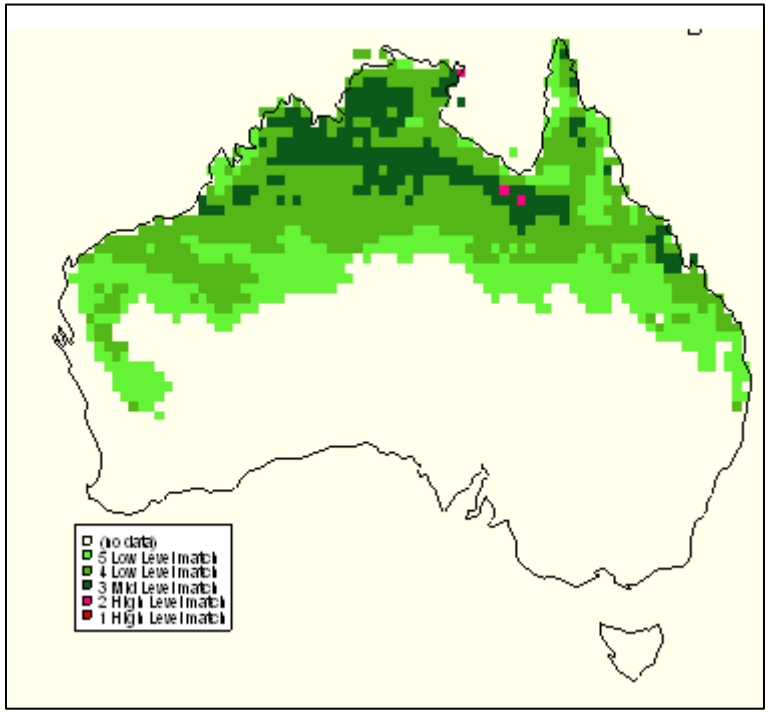
World Distribution – Black-spined Toad (*Bufo melanostictus*), includes current and past 1000 years; including natural populations (black) and introduced populations (red).

Each black or red dot is a location where meteorological data was sourced for the climate analysis (see B1), faint grey dots are locations available for CLIMATE analysis but are not within the species' distribution therefore not used.



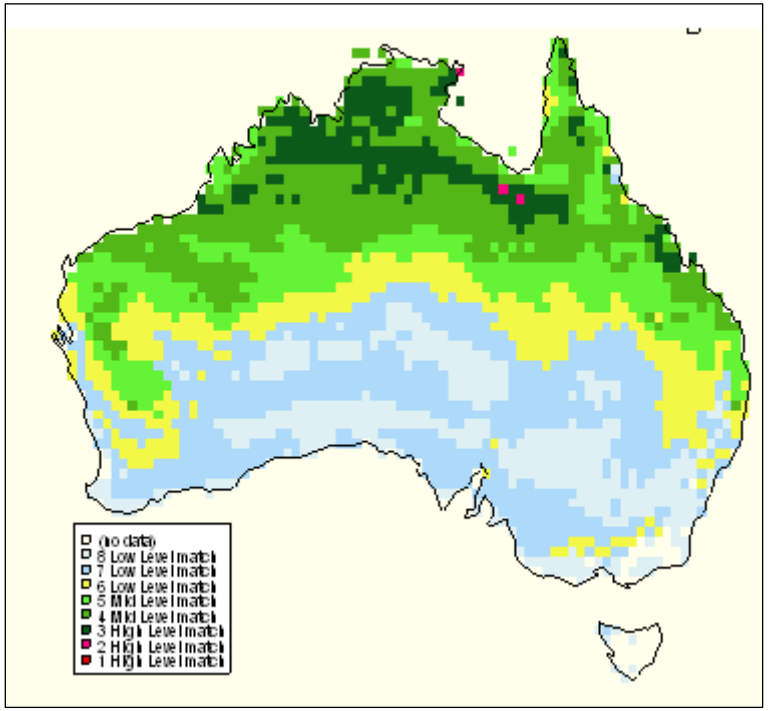
Map 1. Climate match between the world distribution of Black-spined Toad (*Bufo melanostictus*) and Australia for five match classes.

Colour on Map	Level of Match from Highest (10) to Lowest (6)	No. Grid Squares on Map
Red	10 HIGH MATCH	0
Pink	9 HIGH MATCH	3
Dark Green	8 MOD MATCH	194
Mid Green	7 MOD MATCH	562
Lime Green	6 LOW MATCH	424
		CMS = 1183



Map 2. Climate match between the world distribution of Black-spined Toad *(Bufo melanostictus)* and Australia for eight match classes.

Colour on Map	Level of Match from Highest (10) to Lowest (3)	No. Grid Squares on Map
Red	10 HIGH MATCH	0
Pink	9 HIGH MATCH	3
Dark Green	8 HIGH MATCH	194
Mid Green	7 MOD MATCH	562
Lime Green	6 MOD MATCH	424
Yellow	5 MOD MATCH	378
Blue	4 LOW MATCH	732
Light blue	3 LOW MATCH	437



References

Berry PY and Bullock JA (1962). The Food of the Common Malayan Toad, Bufo melanostictus Schneider. *Copeia,* 1962(4):736-741.

Bomford M (2003). Risk Assessment for the Import and Keeping of Exotic Vertebrates in Australia. Bureau of Rural Sciences, Canberra.

(2006). Risk assessment for the establishment of exotic vertebrates in Australia: recalibration and refinement of models - A report produced for the Department of Environment and Heritage. Bureau of Rural Sciences, Canberra, pp.130.

(2008). Risk assessment models for establishment of exotic vertebrates in Australia and New Zealand - A report produced for the Invasive Animals Cooperative Research Centre. Bureau of Rural Sciences, Canberra.

Bomford M, Kraus F, Braysher M, Walter L and Brown L (2005). Risk Assessment Model for the Import and Keeping of Exotic Reptiles and Amphibians. A report produced for the Department of Environment and Heritage. Bureau of Rural Sciences, Canberra, pp.110.

Brown L, Barry S, Cunningham D and Bomford M (2006). Current practice in applying CLIMATE for weed risk assessment in Australia. In: Proceedings of the 15th Australian Weeds Conference, Adelaide, South Australia, pp.703-706.

Bureau of Rural Sciences (2006). CLIMATE software. Bureau of Rural Sciences, Department of Agriculture, Fisheries and Forestry, Canberra. http://adl.brs.gov.au/anrdl/metadata_files/pe_brs90000003434.xml [Access date:09/04/2010].

Catalogue of Life (2008). Catalogue of Life: 2008 Annual Checklist. http://www.usa.species2000.org [Date accessed:01/11/2007].

Church G (1960). The Invasion of Bali by *Bufo melanostictus*. *Herpetologica,* 16(1):15-21.

CITES (2007). Appendices I, II and III. CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora). http://www.cites.org [Access date:01/02/2008].

Cogger HG (2000). *Reptiles & Amphibians of Australia*. Reed New Holland, Sydney.

Das M, Mallick BN, Dasgupta SC and Gomes A (2000). A sleep inducing factor from common Indian toad *(Bufo melanostictus*, Schneider) skin extract. *Toxicon,* 38(9):1267-1281.

Datta Munshi JS, Bilgrami KS, Singh ON and Singh D (1986). Food and feeding habits of tadpole larva of toad *Bufo melanostictus Environment and Ecology,* 4(1):109-111.

Dept of the Environment Water Heritage and the Arts (2008). EPBC Act List of Threatened Ecological Communities. Australian Government. http://www.environment.gov.au/cgi-bin/sprat/public/publiclookupcommunities.pl [Date accessed:15/01/2008].

HAGR Human Ageing Genomic Resources (2006). AnAge Database. Human Ageing Genomic Resources http://genomics.senescence.info/ [Access.

Hossain E, Chowdhury MM and Iqubal KF (2008). A survey on the faunal diversity of Savar, Upazila, Dhaka, Bangladesh. *Pakistan Journal of Biological Sciences,* 11(3):373-379.

Inger RF and Lian TF (1996). Checklist of the frogs of Borneo. *The Raffles Bulletin of Zoology,* 44(2):551-574.

ITIS Integrated Taxonomic Information System (2007). Integrated Taxonomic Information. www.itis.gov [Access date:31/01/2008].

Keomany S, Mayxay M, Souvannasing P, Vilayhong C, Stuart BL, Srour L and Newton PN (2007). Toad Poisoning in Laos. *American Journal of Tropical Medicine and Hygiene,* 77(5):850-853.

Khan MS (2000). *Bufo melanostictus* Southeast Asian Toad. AmphibiaWeb, Berkeley, California. http://www.amphibiaweb.org [Access date:25/06/2008].

Lever C (1985). *Naturalised Mammals of the World*. Longman, London.

(2006). *Naturalized Reptiles and Amphibians of the World*. Oxford University Press.

Massam M, Kirkpatrick W and Page A (2010). Assessment and prioritisation of risk for 40 exotic animal species Department of Agriculture and Food, Western Australia. Invasive Animals Cooperative Research Centre, Canberra.

Mermin J, Hutwagner L, Vugia D, Shallow S, Daily P, Bender J, Koehler J, Marcus R and Angulo FJ (2004). Reptiles, Amphibians, and Human Salmonella Infection: A Population-Based, Case-Control Study. *Clinical Infectious Diseases,* 38:253–261.

National Geographic (2002). National Geographic News. National Geographic Society. http://news-panther.nationalgeographic.com/news/2002/10/photogalleries/1028_halloween1.html [Access date:24/06/2008].

Obst FJ, Klaus R and Jacob U (1988). *The Completely Illustrated Atlas of Reptiles and Amphibians for the Terranium*. T.F.H. Publications Inc., USA.

Pheloung PC (1996). *CLIMATE: a system to predict the distribution of an organism based on climate preferences*. Agriculture Western Australia, Perth.

Schumacher J (2006). Selected Infectious Diseases of Wild Reptiles and Amphibians. *Journal of Exotic Pet Medicine,* 15(1):18-24.
Sreeletha KS, Natarajan P and Rita Kumari SD (1990). Studies on the food and feeding behaviour of *Bufo melanostictus* (Schneider). *Journal of Ecobiology,* 2(3):213-221.
van Dijk PP, Iskandar D, Lau MWN, Huiqing G, Baorong G, Kuangyang L, Wenhao C, Zhigang Y, Chan B, Dutta S, Inger R, Manamendra-Arachchi K and Khan MS (2004). *Bufo melanostictus*. IUCN Red List of Threatened Species. http://www.iucnredlist.org [Access date:09/04/2010].
Zhao E, Wu G and Inger RF (1989). Ecological and Geographic Distribution of the Amphibians of Sichuan, China. *Copeia,* 1989(3):549-557.