Australia's faunal extinction crisis

An inquiry by the Senate Environment and Communications References Committee

Submission by the Invasive Species Council

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About the Invasive Species Council

The Invasive Species Council was formed in 2002 to advocate for stronger laws, policies and programs to keep Australian biodiversity safe from weeds, feral animals, exotic pathogens and other invaders. We are a not-for-profit charitable organisation with over 2000 supporters. Our work is funded by donations from supporters and philanthropic organisations.

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1. Introduction

We address four main issues in this submission:

1. invasive species as a dominant cause of faunal decline and extinction – of greatest relevance to ToR (d);
2. key threatening processes (KTPs) and threat abatement plans (TAPs) as an essential approach to conserving threatened fauna – of greatest relevance to ToRs (d), (h), (i);
3. islands as sites of extremely high vulnerability for faunal extinction, particularly due to invasive species, and as opportunities for protecting threatened fauna – of greatest relevant to ToRs (d), (l); and
4. the importance of ambition, inspiration, monitoring, prevention and appropriate institutions – of greatest relevant to ToRs (i), (l).

These issues warrant a concerted focus by the committee, for they go to the heart of why Australia is failing to stop animal extinctions and reverse declines. Unless harmful invasive species can be prevented, eradicated or controlled, unless the KTP and TAP functions under the Environment Protection and Biodiversity Conservation (EPBC) Act are used effectively, and unless islands have stronger biosecurity, it is inevitable that threatened fauna will continue to decline and go extinct and that more fauna will become threatened.

Following is a brief overview of each issue. For each of the first three issues, we attach a report that constitutes the main body of our submission.

2. Invasive species as extinction drivers

See **Attachment 1**: Low T. 2017. *Invasive species: a leading threat to Australia's wildlife*. Invasive Species Council.

Australia has been greatly impoverished by the extinction and decline of its highly distinctive wildlife. The losses to date have primarily been caused by invasive species, as documented in Attachment 1: 'invasive species have been overwhelmingly the main cause of animal extinctions in Australia, primarily responsible for at least three-quarters of the mammal losses, about half the bird losses and all frog and lizard losses'. The mammal losses have been particularly dire – Australia's loss of 29 endemic mammal species account for more than a third of the world's total (Woinarski et al. 2015).

The rate of extinctions has not declined, and invasive species have caused the majority of recent extinctions. Four of the five vertebrates that have gone extinct in the past decade – two totally extinct and two extinct in the wild – have been due to invasive species. They were all endemic to Christmas Island and inhabited a large national park:

- Christmas Island pipistrelle (*Pipistrellus murrayi*), extinct in 2009
- Christmas Island forest skink (*Emoia nativitatus*), extinct in ~2010
- Blue-tailed skink (*Cryptoblepharus egeriae*), extinct in the wild in ~2010
- Lister's gecko (*Lepidodactylus listeri*), extinct in the wild in ~2011

A fourth lizard, the coastal skink (*Emoia atrocostata*), also disappeared from Christmas Island in about 2010, but the species as currently defined still survives in north Queensland, New Guinea and Asia. There are suspicions the Christmas Island form was a separate species, but this cannot be confirmed because no specimens were collected (Smith et al. 2012; Attachment 1).

Asian wolf snakes (*Lycodon capucinus*), first reported on Christmas Island in the late 1980s, are the most likely main cause of the lizard losses, with other exotic predators – cats, black rats and Asian giant centipedes – perhaps also contributing to the decline.

Christmas Island offers a sobering case study of the destruction that can be wrought by invasive species. It is also a case study of preventable extinctions (eg see Woinarski et al. 2017). The action taken to try to conserve these species was too slow and too late, a common problem, particularly on islands.

Invasive species are a threat for most threatened species. There have been two major assessments of the prevalence of different threat categories impacting species listed under the EPBC Act. The most recent, by Kearney et al. (in press), based on IUCN categories of threat, found that invasive species affect the largest number of listed threatened vertebrate species: 94% (see Table 1 below). System modifications (e.g. fire) affect 66% of listed vertebrates and agricultural activity 70%. The other study, by Evans et al. (2011), using different threat categories, found that habitat loss was the leading threat, affecting 84% of listed vertebrates (see Table 2 below). Introduced species affected 76% of the vertebrates. However, Evans et al. classified exotic diseases separately (as part of a diseases category), which means the total for introduced species would be about the same as that for habitat loss. Inappropriate fire regimes affected 35% of the listed vertebrates. Similar trends apply for listed invertebrates.

Depending on how threats are classified, it is clear that invasive species and habitat loss are the leading threats for vertebrate animals in Australia, with inappropriate fire regimes and agricultural activity also major threats. It is also clear that most threatened species face multiple threats.

The majority of animal extinctions have been caused by a few invasive species – primarily cats, foxes, rats and chytrid fungus. However, dozens of other invasive species are also major threats. Kearney et al. (in press) note that 230 non-native species are listed in the SPRAT database as threats to listed species (not just threatened animals).

Although most of the big invasive species threats have been in the country many decades – introduced deliberately or accidentally before Australia had an effective biosecurity system – new invasive species keep arriving, and some of these will become future causes of decline and extinction. Red imported fire ants, electric ants and yellow crazy ants are examples of recent accidental arrivals that could severely threaten native animals. The first two are subject to national eradication efforts, and yellow crazy ants in the Wet Tropics to regional eradication (but not other populations in Queensland and the Northern Territory). One very recent arrival is an unidentified bacterial pathogen that has killed Lister's geckoes in captivity on Christmas Island (Attachment 1, Low 2017). It was first recorded in October 2014 when it resulted in the death of 40 geckoes, a 100% mortality rate among those infected. There are fears this disease will reach mainland Australia and infect other native reptiles.

The fact that new invasive species keep arriving means that conserving native species requires not only controlling or eradicating established species but also preventing new harmful arrivals. Australia's biosecurity performance needs to improve if we are to prevent new declines and extinctions.

Table 1: Prevalence of threats to listed threatened species by Kearney et al (in press)

	Amphibians	*Birds*	*Fish*	*Mammals*	*Reptiles*	*Invertebrates*
Threat	N=29	N=84	N=34	N=74	N=51	N=48
Invasive species	100	95.2	97.1	97.3	82.4	79.2
Ecosystem modifications	66.5	72.6	79.4	62.2	54.9	79.2
Agricultural activity	69	82.1	47.1	73	60.8	72.9
Human disturbance	51.7	35.7	38.2	27	23.5	20.8
Climate change	44.8	56	55.9	37.8	29.4	45.8
Transportation	41.4	16.7	2.9	17.6	11.8	14.6
Over-exploitation	48.3	40.5	52.9	28.4	21.6	50
Urban development	24.1	26.2	29.4	14.9	33.3	31.2
Energy production	10.3	20.2	47.1	16.2	31.4	10.4
Pollution	44.8	19	61.8	6.8	19.6	25

% of listed threatened species affected	81-100%	61-80%	41-60%	21-40%	0-20%

Table 2: Prevalence of threats to listed threatened species by Evans et al. (2011)

	Amphibians	*Birds*	*Fish*	*Mammals*	*Reptiles*	*Invertebrates*
Threat	N=22	N=104	N=43	N=84	N=48	N=22
Habitat loss	72.7	87.5	81.4	79.8	91.7	77.3
Introduced species	86.4	80.8	67.4	76.2	70.8	54.5
Inappropriate fire regimes	36.4	42.3	-	44	31.3	54.5
Disease	72.7	29.8	7	11.9	6.3	-
Pollution	31.8	22.1	32.6	9.5	27.1	22.7
Over-exploitation	18.2	49	41.9	27.4	27.1	22.7

3. The importance of KTPs and TAPs

See **Attachment 2**: Invasive Species Council. 2018. *KTPs & TAPS: Australia's failure to abate threats to biodiversity*. Discussion paper. Invasive Species Council.

Australia's national processes to protect and recover threatened species are failing. One major reason for this are deficient processes for mitigating major threats through the listing of key threatening processes (KTPs) and the preparation and implementation of threat abatement plans (TAPs) under the EPBC Act. An effective KTP/TAP system is essential for arresting loss of Australia's biodiversity, and developing solutions for major threats is typically more effective and more cost-effective than a species-by-species approach, and also benefits myriad other, often poorly known, species at risk from KTPs.

Attached is a discussion paper on KTP and TAP processes (Attachment 2) that analyses the major flaws of the system and makes broad recommendations for reform. Later this year, the Invasive Species Council will host a workshop to further develop an environment sector proposal for reform. Here we very briefly summarise the eight major flaws of the current system and outline five major categories of reforms needed.

Summary of KTP & TAP process flaws

1. **Limited coverage of major threats**: There are no KTP listings for inappropriate fire regimes, altered hydrological regimes or grazing; the land clearing KTP has no TAP; and the majority of invasive species threats are encompassed within the 'novel biota' KTP, a moribund listing that lacks a TAP. This means the KTP/TAP system is not applied for most major threats to biodiversity and only partially for invasive species.

2. **Stymied listing of invasive species**: For the past six years at least, there has been a refusal to assess invasive species KTP nominations or list any more invasive KTPs. The main reason given in six cases is that invasive species threats are encompassed within a catch-all 'novel biota' KTP. In a seventh case, the environment minister refused to list the KTP, contrary to advice by the Threatened Species Scientific Committee. Stymieing further invasive species listings appears to be a deliberate strategy to limit funding demands.

3. **Slow, tedious and ad hoc KTP listing processes**: The listing of KTPs is mostly ad hoc, relying on public nominations and ministerial prerogative, and the assessment processes are slow and tedious. The three KTP listings of the past decade (excluding the novel biota KTP nominated by the scientific committee) have taken three to four years from nomination to listing. Two rejected nominations took five and seven years to complete, and one nomination still under assessment is more than 10 years old. No KTP nomination since 2011 has even been assessed.

4. **Moribund KTP listings**: Almost a third of listed KTPs have no TAP. This could be acceptable if there were already effective processes for abating those threats. But this is mostly not the case. The threat level for KTPs without TAPS – particularly land clearing, climate change, escaped garden plants, noisy miners and novel biota – are all likely to have increased since their listings. There is no requirement

to show that alternative abatement processes are effective, to monitor abatement progress, or to initiate action if existing processes prove ineffective.

5. **Limited abatement progress**: Due to a lack of monitoring and regular reporting, the only feasible way of assessing the effectiveness of most threat abatement efforts is through the five-yearly reviews of TAPs required under the EPBC Act. But only half the KTPs can be assessed in this way: six KTPs lack a TAP and four TAPs have not been reviewed despite being overdue by one to four years for review (or their reviews have not been made publicly available). Eleven TAPs (52%) have been reviewed at least once, although only three by independent reviewers. Those reviews indicate that good progress was achieved for four TAPs, moderate progress for four TAPs and poor progress for three TAPs. Although fewer than half of KTP listings have resulted in moderate to good progress on threat abatement, the examples of good abatement progress demonstrate that major threats to Australian biodiversity are surmountable.

6. **Slow TAP processes**: It has taken an average four years to prepare or revise TAPs for the nine KTPs listed since 2001 that have a TAP. Most TAPs are reviewed within five to six years, but then it often takes several years for TAPs to be revised after a review – it took eight years to revise the root-rot fungus TAP, and five years after a ministerial decision to revise the fox TAP, it has still not been updated. Of 15 existing TAPs, 60% (9) are more than 6 years old and 27% (4) are 10 years old.

7. **Limited obligations and accountability**: Although the Australian Government has international obligations to abate threats to biodiversity, there is no obligation under the EPBC Act to list the major threats or act on them. The environment minister has complete discretion about whether to accept the advice of the Threatened Species Scientific Committee to assess a KTP nomination, list a KTP or prepare a TAP. The minister can also delay decisions for years and starve the assessment processes of funding. This means our national system for recognising and abating threats is highly vulnerable to political interference. Moreover, KTP listings come obligation free. Even if the minister decides that a TAP should be prepared, the EPBC Act obliges the federal government to do little to implement it, apart from in Commonwealth areas. A KTP listing or TAP also does not generate any obligations for other governments, landholders or anyone whose actions may exacerbate the KTP. There are no requirements for the federal government to monitor or report on KTP status. The one reporting obligation is the 5-year review of each TAP, but with no requirement for this review to be independent.

8. **Limited leadership, commitment and funding**: Although the federal government is limited in the extent to which it can compel other governments or individuals to undertake threat abatement, it can apply considerable pressure through strong leadership, incentives and funding for abatement, and use of its own laws to partially compensate for state or territory failings. These have been largely missing in KTP/TAP processes. Abating KTPs has been a low federal government priority. Leadership has improved to some extent with the appointment of a Threatened Species Commissioner as a champion for threatened species and facilitator of partnerships. This has generated considerable focus on the feral cat KTP (and a modest level of additional funding for abating that threat). There is no information about how much Australia spends on abatement (from government and non-government sources), nor how much is needed to properly implement

abatement plans. It is clear from the limited progress that the gap between available and needed funding is considerable.

Summary of changes needed

1. **Make threat abatement a high national priority**: An essential first step is greater recognition that an effective KTP/TAP system is essential for arresting loss of Australia's biodiversity, and that developing solutions for major threats is typically more effective and more cost-effective than a species-by-species approach, and also benefits myriad other, often poorly known, species at risk from KTPs. To drive reform of the KTP/TAP system, Australia needs an ambitious (but realistic) conservation strategy that specifies long-term goals for threat abatement. That ambition needs to be then reflected in each of the TAPs. Enlisting commitment from state and territory governments is essential. The federal government should pursue an intergovernmental agreement with the states and territories to achieve long-term abatement goals for recovery of threatened species and ecological communities.

2. **Strengthen governance and accountability**: The assessment and listing of KTPs and preparation of TAPs should be free of political influence and not subject to ministerial discretion. We endorse the recommendation by the Places You Love Alliance for an independent National Sustainability Commission to undertake such functions. It is also worth considering co-governance models, such as exemplified by the industry-government partnerships, Animal Health Australia and Plant Health Australia. More meaningful, independent and regular reporting is needed. The five-yearly TAP reviews are important and, for the sake of credibility and rigour, should be done by expert reviewers independent of government. An annual progress report (based on meaningful abatement indicators) should be presented to the federal parliament. This needs to be underpinned by monitoring of threatening processes and the species and ecological communities at risk.

3. **Systematically list KTPs for all matters of national environmental significance**: The KTP list under the EPBC Act should be the authoritative list of major threats to Australian biodiversity. The listing process needs to be more systematic to properly reflect the major threats. A systematic expert process can be supplemented by a public nomination process to fill gaps and keep the KTP list up to date. Australia's KTP list should be scientifically determined. As with similar processes at the state level, the decision to assess and list a KTP should emerge wholly from an independent scientific process.

4. **Strengthen obligations for abatement**: For each KTP, it should be mandatory to prepare a TAP (or equivalent) to specify long-term abatement goals and shorter-term targets, the research and actions needed to achieve them and a monitoring regime. A TAP should serve as a national statement of what is needed to achieve abatement and as the basis for monitoring and reporting on the status of the KTP and abatement progress. A TAP should be required even where abatement can best be achieved through existing processes or relies on processes beyond the control or influence of the federal government. This ensures that the federal government takes responsibility under the EPBC Act for specifying the desired conservation direction and monitoring progress. If state and territory governments fail to participate in implementing TAPs, the federal government should be obliged to consider options for over-riding or compensatory measures, such as using its own laws to limit land

clearing or regulate trade in invasive plants. Obligations should extend to individuals and corporations. All Australians are bound by the EPBC Act to avoid having a significant impact on matters of national environmental significance. They should also be bound to avoid actions likely to significantly exacerbate a KTP.

5. **Commit to long-term funding to achieve abatement targets**: A government demonstrates it is serious about mitigating harms when it is prepared to fund the necessary actions. To assess funding needs, each TAP should include an estimate of costs to achieve 10–20-year targets. New funding sources such as levies and taxes should be considered to provide long-term base funding for implementing TAPs.

4. The importance of island biosecurity

See **Attachment 3**: Invasive Species Council and Island Conservation. 2017. *Norfolk Island: protecting an ocean jewel. Recommendations for stronger biosecurity for the Norfolk Island group*. Invasive Species Council and Island Conservation.

Islands are special places for biodiversity. Their isolation often gives rise to a highly endemic biota. But when that isolation is breached by humans and human-introduced species, those unique species are often highly susceptible to decline. Having evolved with fewer competitors, predators and parasites than species on continents, they often have poor defences against invaders. And invasive species often thrive on islands for this reason – there are fewer predators, competitors and pathogens than in their land of origin, as well as vacant ecological niches. (Australia with its unique fauna and susceptibility to invasive species has functioned like an island.) Because of their susceptibility, island fauna are disproportionately represented in lists of threatened and extinct species. Christmas Island, Norfolk Island and Lord Howe Island are particularly sad examples of this. Since European settlement, Christmas Island has lost four endemic mammals and at least three endemic reptiles; Norfolk Island has lost seven endemic birds and six endemic snails; and Lord Howe Island has lost eight endemic birds and at least 11 endemic invertebrates.

Conversely, islands often offer sanctuary from invasive species – seven Australian mammals extinct on the mainland due to cats and foxes are now confined to islands (Woinarski et al. 2015). Islands often also offer excellent opportunities to recover threatened species because of the potential to eradicate invasive species. The likes of cats, foxes, rats, pigs and goats cannot be eradicated from the mainland with available methods but it is feasible on islands. By 2014, worldwide, there had been 203 successful eradications of 13 invasive animal species on 157 Australian islands (see http://diise.islandconservation.org). Australia has been a global leader in island eradications, and it is one of the very few ways by which we have made advanced biodiversity conservation over the past few decades.

A striking example of the benefits of eradicating invasive species (particularly predators) from islands is Macquarie Island. Until recently, globally important seabird populations and unique sub-Antarctic ecosystems were being destroyed on Macquarie by feral cats, rabbits, ship rats and house mice. Since completion of the eradication program in 2014, populations of eight threatened bird species have either stabilised or recovered. An assessment by Birdlife Australia in 2016 found they are now less likely to go extinct and recommended that their conservation status be down-listed. As a result, Birdlife International has down-listed one species from critically endangered to endangered, one from critically endangered to vulnerable, five from endangered to least concern and two from vulnerable to least concern – by far the largest-ever down-listing of Australian threatened taxa (see http://datazone.birdlife.org/country/australia for listings, a far more accurate reflection of the status of Australian birds than listings under the EPBC Act). Birdlife International won't change the status of an additional six threatened seabird species for now, but for most species, encouraging signs of their recovery are evident.

For all the reasons mentioned above – the unique wildlife of islands and their susceptibility to invasive species, and the sanctuary functions and conservation potential of islands – rigorous biosecurity is essential.

Attached is a report on Norfolk Island, an island exemplifying the importance of biosecurity (Attachment 3). In it we outline the conservation values of Norfolk Island, including rare and endemic fauna species, and major invasive threats such as cats, rats, Argentine ants and weeds. We describe the existing inadequate biosecurity arrangements and recommend changes to strengthen biosecurity.

Australia needs a comprehensive national plan of action for island biosecurity. An NGO proposal for a National Island Biosecurity Initiative, endorsed by the Invasive Species Council, includes the following elements (Nias et al. 2010):

1. Prioritisation of Australia's islands based on each island's ecological values and risk assessment, with cost estimates for the eradication of existing invasive species
2. Individual biosecurity systems for high priority islands and regional biosecurity management systems for other islands, including:
    - strict quarantine processes to prevent harmful incursions and imports
    - regular surveillance of high- and medium-priority islands, and occasional surveillance of lower-priority islands
    - biosecurity training for island managers and best-practice biosecurity practices
    - capability for responding quickly to new incursions (including the ready availability of equipment and expertise)
    - biosecurity education for island dwellers and visitors.

5. The need for ambition, inspiration, prevention and monitoring

Underlying Australia's extinction crisis are institutional and cultural failings. Currently, the country lacks the ambition, structures and processes necessary for reversing extinction trends. A few legal tweaks and a bit more funding won't do it. Here, very briefly, are some of the deeper changes needed.

Ambition: The much-criticised draft of *Australia's Strategy for Nature 2018-2030* exemplifies the current lack of ambition for saving Australia's wildlife. It is weak and vague, a strategy for business as usual, not fit for dealing with an extinction crisis. The country needs an ambitious strategy demonstrating a strong commitment to avoid any more extinctions and to reverse the current extinction trends. The strategy needs to be tempered by realism, of course, but also recognise the potential to make great strides and achieve breakthroughs when there is sufficient commitment. An example of the sort of ambition needed is 'Predator Free 2050', New Zealand's plan to eradicate the country's most damaging introduced predators.

Inspiration and leadership: Currently, very low political and cultural priority is given to saving species, apart from icons such as the koala. The goal to solve Australia's extinction crisis must be given national prominence. It should be promoted as an important nation-building endeavour for all Australians and governments. What could be more patriotic than saving the species that make Australia unique? The appointment of a threatened species commissioner as a champion for threatened species has improved national leadership but has not been backed up with other elements indicative of a national priority.

Learning from successes and failures: An important part of improving Australia's performance is to learn from both successes and failures. For example, there should be analysis of the factors contributing to effective threat abatement and species recovery. We should also learn as much as we can from the ultimate failure – when a species goes extinct. We endorse the proposal by Woinarski et al. (2017) for a process equivalent to a coronial inquiry each time a species goes extinct – 'to identify what went wrong, and how laws, policies and practices can be improved to reduce the likelihood of future extinctions' (this reference is provided as **Attachment 4**).

Monitoring and analysis: Effective strategies and plans need to be underpinned by comprehensive up-to-date information and detailed analysis. Yet, most threatened species and the threats they face are poorly monitored or not monitored at all and we often lack the sort of analysis needed to inform plans such as the cost of options and long-term prospects for development of effective control options.

Forecasting and prevention: Many future threats can be predicted and measures put in place to prevent them. However, our institutions and policies tend to prioritise existing major threats, and conservation responses are typically reactive, often too little far too late. The adoption of precautionary, preventative and risk-based policies, such as strong biosecurity to prevent new harmful invasive species and respond quickly to new arrivals, will reduce future threats. The recent

national biosecurity review recommended that environmental biosecurity be considerably strengthened (Craik 2017). One essential element of prevention is forecasting (horizon scanning, for example) to enable proactive responses to the changing nature of threats, including social and technological changes, increasing global trade and travel, population growth and climate change. The 10-year review of the EPBC Act recommended the establishment of a forecasting unit within the federal environment department (Hawke 2009).

Appropriate institutions: We endorse the proposal of the Places You Love Alliance for an independent Sustainability Commission to undertake tasks such as species recovery and threat abatement planning. This should foster continuity, and partly overcome problems of political short-termism and political interference.

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