Chapter 4

Management of key threats to threatened species and ecological communities

> Addressing threatening processes should be a very high priority in Australia because we have a limited number of significant threats that are driving a whole range of species to extinction...The way forward with threats, I believe, is to focus on a small number of pervasive, key threats that affect a large number of species and adequately resource these threats.[1]

4.1 This chapter discusses the key threats to threatened species and ecological communities raised during this inquiry. This is followed by a discussion of the regulatory processes, particularly under the EPBC Act, for listing of key threatening processes and threat abatement planning.

What are the key threats?

4.2 *Australia's Biodiversity Conservation Strategy 2010-2030* (the Biodiversity Strategy) identifies the main threats to Australia's biodiversity as including:

- habitat loss, degradation and fragmentation;
- invasive species;
- unsustainable use and management of natural resources;
- changes to the aquatic environment and water flows;
- changing fire regimes; and
- climate change.[2]

4.3 In terms of threats to threatened species and ecological communities, the *Australian State of the Environment Report 2011* noted that the most frequently cited threats in listings under the EPBC Act are habitat fragmentation and the spread of invasive species.[3]

4.4 The following additional pressures were identified for marine species:

> …the extraction of resources through fishing; introduction of marine invasive species; disturbance to habitats through shipping, and oil and gas

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1 Dr Andrew Burbidge, *Committee Hansard*, 7 March 2013, p. 1.

2 Natural Resource Management Ministerial Council 2010, *Australia's Biodiversity Conservation Strategy 2010-2030*, Australian Government, 2010, p. 8; see also SEWPAC, *Australian State of the Environment Report 2011*, p. 617, at: http://www.environment.gov.au/soe/2011/ (accessed 22 April 2013).

3 SEWPAC, *Australian State of the Environment Report 2011*, p. 617, at: http://www.environment.gov.au/soe/2011/ (accessed 22 April 2013).

exploration and production; habitat alteration through urban expansion or aquaculture facilities; and pollution including catchment run-off.[4]

4.5 These key threats to threatened species and ecological communities were well recognised in many submissions to this inquiry. The key threats consistently raised were: habitat loss and fragmentation,[5] invasive species (including disease);[6] inappropriate fire regimes;[7] and climate change.[8] Changes in flow regime and water quality were also noted as threats, particularly for aquatic species.[9] For threatened species dependent on the Great Barrier Reef, pollution and water quality were also identified.[10]

4.6 The committee also heard of other species-specific threats, for example, the lack of effective fish passages threatening species such as the lungfish;[11] or the impact of shooting in commercial orchards on flying-foxes.[12]

4.7 Some of the key threats raised during this inquiry are discussed further below.

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4 SEWPAC, *Australian State of the Environment Report 2011*, p. 617, at: http://www.environment.gov.au/soe/2011/ (accessed 22 April 2013).

5 See, for example, WWF-Australia, *Submission 81*, p. 3; Dr Martine Maron, *Submission 55*, pp 1–2; Island Conservation, *Submission* 20, p. 3; Threatened Plant Action Group, Nature Conservation Society of South Australia, *Submission 157*, p. 2; Canberra Ornithologists Group, *Submission 113*; Ms Kerryn Parry-Jones, *Submission 87*, pp 1–2; Australasian Bat Society, *Submission 110*, p. 4.

6 See, for example, Professor Hugh Possingham and Associate Professor Michael McCarthy, *Submission 127*, p. 3; Save the Bilby Fund, *Submission 16*, p. 1; Zoo and Aquarium Association, *Submission 27*, p. 1; Island Conservation, *Submission* 20; Invasive Species Council, *Submission 140*; Mr Peter Cosier, Wentworth Group of Concerned Scientists, *Committee Hansard*, 15 February 2013, p. 35; Zoo and Aquarium Association, *Submission 27*, p. 1; Colong Foundation for Wilderness, *Submission 43*, p. 6; ACF, *Submission 147*, p. 2.

7 See, for example, East Gippsland Wildfire Taskforce, *Submission 11*; Save the Bilby Fund, *Submission 16*, p. 1; Arid Lands Environment Centre, *Submission 151*, p. 1; Department of Land Resource Management, NT Government, *Submission 159*, p. 1; Friends of Hoddles Creek, *Submission 109*.

8 See, for example, WWF-Australia, *Submission 81*, p. 4; CSIRO, *Submission 77*, pp 6–7; ACF, *Submission 147*, pp 2–3; Invasive Species Council, *Submission 140*, p. 6; Mr Peter Cosier, Wentworth Group of Concerned Scientists, *Committee Hansard*, 15 February 2013, p. 35; Professor Lee Godden, *Committee Hansard*, 20 February 2013, p. 11; Invasive Species Council, *Submission 140*, p. 6; Clarence Environment Centre, *Submission* 63, p. 4; see also SEWPAC, *Submission 143*, p. 11.

9 See, for example, Minister for Environment and Heritage Protection Queensland, *Submission 130*, p. 3; Mr Roger Currie, Wide Bay Burnett Environment Council, *Committee Hansard*, 22 February 2013, p. 13.

10 See, for example, Minister for Environment and Heritage Protection Queensland, *Submission 130*, p. 3; Mr Jonathan Meddings, *Submission 58*.

11 See further: Wide Bay Burnett Environment Council, *Submission 168*; and also Mr Roger Currie, Wide Bay Burnett Environment Council, *Committee Hansard*, 22 February 2013, p. 13; Mr Jeremy Tager, *Submission 89*.

12 Australasian Bat Society, *Submission 110*, p. 3; Batwatch Australia, *Submission 139*, p. 6.

Habitat loss and fragmentation

4.8 The Biodiversity Strategy outlines the problem of habitat loss, degradation and fragmentation for biodiversity:

> Habitat loss and fragmentation affect the well-being and survival of individual populations as well as entire species and in time may affect the function of entire ecosystems. Direct causes of habitat loss, degradation and fragmentation include clearing of native vegetation and pollution of waterways and marine areas.[13]

4.9 WWF-Australia submitted that direct habitat destruction 'is the main reason for terrestrial species becoming endangered'.[14]

4.10 The committee heard, for example, about the loss of habitat due to mining, urban development and agriculture.[15] More specific examples included the loss of spawning habitat for lungfish,[16] the effects of the loss of hollow bearing trees on the superb parrot;[17] and clearing for urban development and its impacts on koalas.[18]

4.11 However, the committee also heard that controls on land clearing introduced by state and territory governments in recent years may have made a big impact in relation to habitat loss and fragmentation. WWF-Australia asserted that:

> By far the most effective threat abatement has been the introduction of land clearing or vegetation management legislation in the states and territories. This has had a dramatic impact on deforestation and habitat loss…[19]

4.12 However, Dr Martine Maron was not so sure, indicating that her research in Queensland shows that vegetation removal continues to be a primary threat:

> Although clearing rates have declined since the introduction of the legislation [the *Vegetation Management Act 1999* (Qld)], current clearing rates for endangered and of concern vegetation communities as a proportion of remaining extent are still approximately double that of 'not of concern' vegetation. Therefore, those ecosystems that have historically been most threatened continue to be the most threatened under the current legislation.[20]

4.13 ANEDO similarly observed that clearing for development is still a problem:

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13 Biodiversity Strategy, p. 22.

14 WWF-Australia, *Submission 81*, p. 3.

15 See, for example, Dr Martine Maron, *Submission 55*, p. 1; Australasian Bat Society, *Submission 110*, p. 4.

16 Mr Roger Currie, Wide Bay Burnett Environment Council, *Committee Hansard*, 22 February 2013, p. 13.

17 Dr Adrian Manning, *Submission 30*, p. 1.

18 See, for example, Brisbane Region Environment Council, *Submission 173*, p. 10.

19 WWF-Australia, *Submission 81*, p. 3; also Premier of Western Australia, *Submission 169*, p. 2.

20 Dr Martine Maron, *Submission 55*, p. 2.

> A key threat to many listed species and communities is loss of habitat through clearing for development. Management of this and other threats is frequently undermined by planning and development laws in all jurisdictions.[21]

4.14 In terms of habitat loss and fragmentation, the committee notes that development and environmental assessment processes are discussed further in Chapter 7 of this report. The management of 'critical habitat' is discussed in Chapter 5 of this report, and the 'legacy' effect of past land clearing is discussed later in this chapter.

Invasive species

4.15 The committee received an overwhelming amount of evidence about the various types of invasive species threatening Australia's native species and ecological communities, including weeds (such as buffel grass);[22] pest animals and insects (particularly feral cats[23] and foxes[24]); invasive fungi such as *Phytophthora* and diseases such as chytridiomycosis (which affects amphibians such as frogs).[25]

4.16 The Biodiversity Strategy outlines the ways in which invasive species can cause biodiversity loss, including through:

- competition with native species for food and habitat;
- predation;
- disease impacts; and
- alteration of the physical environment in ways that exclude native species.[26]

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21 ANEDO, *Submission 137*, p. 3; see also Ms Rachel Walmsley, ANEDO, *Committee Hansard*, 15 February 2013, pp 46–47.

22 See, for example, Minister for Environment and Heritage Protection Queensland, *Submission 130*, p. 3; Invasive Species Council, *Submission 140*, p. 5; Arid Lands Environment Centre, *Submission 151*, p. 2.

23 See, for example, Professor John Woinarski, *Committee Hansard*, 7 March 2013, p. 5; Mr Frank Manthey, Save the Bilby Fund, *Committee Hansard*, 22 February 2013, pp 1–3; Arid Lands Environment Centre, *Submission 151*, p. 2.

24 See, for example, Professor John Woinarski, *Committee Hansard*, 7 March 2013, p. 5; Mr Frank Manthey, Save the Bilby Fund, *Committee Hansard*, 22 February 2013, pp 1–3; Clarence Valley Conservation Coalition, *Submission 38*, p. 2. But also camels: Arid Lands Environment Centre, *Submission 151*, p. 2; pigs: Australian Deer Association, *Submission 83*, p. 6; cattle and donkeys: Dr Andrew Burbidge, *Committee Hansard*, 7 March 2013, p. 6.

25 Professor Hugh Possingham and Associate Professor Michael McCarthy, *Submission 127*, p. 3; Save the Bilby Fund, *Submission 16*, p. 1; Zoo and Aquarium Association, *Submission 27*, p. 1; Invasive Species Council, *Submission 140*; Mr Peter Cosier, Wentworth Group of Concerned Scientists, *Committee Hansard*, 15 February 2013, p. 35; also Dr Andrew Burbidge, *Committee Hansard*, 7 March 2013, pp 1 and 5.

26 Biodiversity Strategy, p. 24.

4.17 Dr Carol Booth of the Invasive Species Council described invasive species as the 'predominant cause' of the extinction of mammals in Australia.[27] The Invasive Species Council were concerned that:

> Long-established threats are increasing – feral cats in northern Australia, Phytophthora cinnamomi in southwest Australia, feral goats in semi-arid areas, weeds virtually everywhere, for example – and new threats are emerging – foxes in Tasmania, feral deer in many new locations, myrtle rust in eastern Australia, yellow crazy ants in the Wet Tropics...[28]

Importance of islands and predator proof sanctuaries

4.18 Evidence was received about the value of islands for threatened species conservation, and several programs to eradicate invasive species on these islands.[29] Island Conservation highlighted the importance of islands for threatened species:

> Islands are critical habitat for 31% of Australia's critically endangered and endangered fauna, and for 37% of the vulnerable fauna, including many endemics. Overall, 111 threatened fauna species occur on Australia's islands, out of a national total of 325 (35%). A high proportion of these species are directly threatened with extinction by one or more invasive species.[30]

4.19 Island Conservation concluded that island-specific biosecurity approaches are therefore an 'essential measure to slow Australia's ongoing extinction rate'.[31]

4.20 As Dr Andrew Burbidge commented, islands 'are much easier to manage than mainland areas'. However, he also emphasised the importance of biosecurity:

> It is no good eradicating rats or cats from an island if they just come back again because there is no biosecurity—no quarantine—for those places.[32]

4.21 Professor John Woinarski agreed:

> …there are many species which formerly occurred across large swathes of the mainland landscape but which now are restricted to islands. That is largely because many of the threats do not occur on those islands. So there is a great imperative to ensure that the quarantine status of those islands is properly respected and that the opportunities that they provide for national scale conservation are recognised.[33]

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27 Dr Carol Booth, Invasive Species Council, *Committee Hansard*, 22 February 2013, p. 9; and see also Invasive Species Council, *Submission 140*, pp 4–5.

28 Invasive Species Council, *Submission 140*, p. 7.

29 Island Conservation, *Submission 20*; Dr Andrew Burbidge, *Committee Hansard*, 7 March 2013, p. 1; Mr Greg Miles, *Submission 72*, pp 9–10.

30 Island Conservation, *Submission 20*, p. 1.

31 Island Conservation, *Submission 20*, p. 1; see also Dr Andrew Burbidge, *Committee Hansard*, 7 March 2013, p. 6.

32 Dr Andrew Burbidge, *Committee Hansard*, 7 March 2013, p. 6.

33 Professor John Woinarski, *Committee Hansard*, 7 March 2013, p. 6.

4.22 The committee also heard that programs to eradicate invasive animals such as rats, cats, foxes, goats and mice on islands have mostly been 'highly successful' and 'have led to major conservation outcomes'. [34] For example, Professor Stephen Garnett from BirdLife Australia pointed to the potential success on Macquarie Island of programs to eradicate rabbits, rats, mice and cats. He was hopeful that a number of threatened birds might be able to come off the threatened species lists as a result of these programs, 'which would be a remarkable achievement globally'.[35]

4.23 The committee also received evidence of success stories where predator-proof sanctuaries or 'mainland islands' have been established. Some suggested this is the only way to deal with some feral animals and in turn ensure the survival of many mammals.[36] As the Colong Foundation for Wilderness articulated:

> The only secure habitat is a fenced area within which all feral wildlife has been eliminated and the fence is adequately maintained.[37]

4.24 For example, Mr Atticus Fleming from the Australian Wildlife Conservancy told the committee that they had created a number of cat and fox free areas on the mainland.[38] At its feral free Scotia Wildlife Sanctuary in western New South Wales, they have seen a substantial increase in several nationally threatened species, including greater bilbies, bridled nail-tail wallabies, numbats, burrowing bettongs and woylies.[39] Others described the work of the Australian Wildlife Conservancy as a good example of an effective response to key threats.[40]

4.25 Dr Adrian Manning submitted information about a research partnership project between the Australian Capital Territory (ACT) Government and the Australian National University where a predator-proof sanctuary has been established at Mulligans Flat in the ACT. The project involved the construction of an 11.5km predator exclusion fence that has provided a 'unique opportunity' to examine the effects of the reintroduction of the Tasmanian bettong on ecosystem restoration.[41]

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34 Dr Andrew Burbidge, *Committee Hansard*, 7 March 2013, p. 6.

35 Professor Stephen Garnett, BirdLife Australia, *Committee Hansard*, 20 February 2013, p. 7; see also BirdLife Australia, *Submission 82*, p. 4. In contrast, Christmas Island was cited as an example where invasive species, particularly Yellow Crazy Ants, are still causing considerable problems: BirdLife Australia, *Submission 82*, pp 5–6; Dr Carol Booth, Invasive Species Council, *Committee Hansard*, 22 February 2013, p. 9.

36 Dr Andrew Burbidge, *Committee Hansard*, 7 March 2013, p. 1; Dr Andrew Burbidge, *Submission 46*, p. 1; Professor John Woinarski, *Submission 48*, p. 3; Mr Kevin Bradley, Save the Bilby Fund, *Committee Hansard*, 22 February 2013, p. 4; see also Mr Greg Miles, *Submission 72*, p. 9.

37 The Colong Foundation for Wilderness, *Submission 43*, p. 4.

38 Mr Atticus Fleming, Australian Wildlife Conservancy, 22 February 2013, p. 19.

39 Australian Wildlife Conservancy, *Submission 162*, p. 4.

40 Dr Andrew Burbidge, *Submission 46*, p. 1.

41 Dr Adrian Manning, *Supplementary Submission 30*, p. 3.

Other control methods

4.26 There was also some discussion on the use of poisons and baiting of feral animals. For example, the use of the poison '1080' was discussed: some suggested greater controls on its use;[42] while others described 1080 as 'the only effective control for red foxes'.[43]

4.27 The committee received positive evidence regarding the successful 'Western Shield' program in Western Australia.[44] During 2010-11, under this program 'more than 3.9 million hectares of conservation lands and State forest were baited to control foxes and feral cats, using nearly 1.1 million poison baits'.[45]

4.28 Professor Woinarski described programs such as 'Western Shield' and 'comparable large-scale, long-term programs aimed at the reduction of feral predators (cats and foxes), through exclosure fencing and/or intensive baiting' as a 'noteworthy' example of success. He commented that these programs 'demonstrate that it is possible to restore ecosystems and increase the abundance of animal species otherwise facing extinction'.[46]

4.29 Others expressed concern at the lack of control methods in relation to some invasive species, such as feral cats.[47] Many submissions suggested that more research is needed to determine effective ways to control feral cats, which are reportedly 'trap shy and rarely eat poisoned baits'.[48] For example, Mr Frank Manthey from the Save the Bilby Fund, described the 'tsunami of cats' threatening the last wild population of the bilby in Queensland. He told the committee that there is an estimated population of 23 million cats in Australia.[49]

4.30 SEWPAC acknowledged the problem in relation to feral cats, telling the committee that:

> Cats have probably contributed to the extinction of many small to medium-sized mammals and ground-nesting birds in the arid zone, and seriously

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42 The Colong Foundation for Wilderness, *Submission 43*, p. 7.

43 Dr Andrew Burbidge, *Committee Hansard*, 7 March 2013, p. 4; see also Save the Bilby Fund, *Committee Hansard*, 22 February 2013, p. 5.

44 See, for example, Premier of Western Australia, *Submission 169*, p. 2; Dr Andrew Burbidge, *Submission 46*, p. 1.

45 Premier of Western Australia, *Submission 169*, p. 23; and see further WA Department of Environment and Conservation, *Western Shield*, at: http://www.dec.wa.gov.au/management-and-protection/programs/western-shield.html (accessed 22 April 2013).

46 Professor John Woinarski, *Submission 48*, p. 3.

47 See, for example, Mr Frank Manthey, Save the Bilby Fund, *Committee Hansard*, 22 February 2013, p. 2; Invasive Species Council, *Submission 140*, p. 18; Department of Land Resource Management, NT Government, *Submission 159*, p. 2; Professor John Woinarski, *Committee Hansard*, 7 March 2013, p. 6.

48 Invasive Species Council, *Submission 140*, p. 18.

49 Mr Frank Manthey, Save the Bilby Fund, *Committee Hansard*, 22 February 2013, p. 2.

> affect bilby, mala and numbat populations. In some instances, feral cats have directly threatened the success of recovery programs for threatened species. The department is putting significant investment into the development of a broad scale toxic bait for feral cats to provide an effective control tool for conservation managers.[50]

4.31 Others suggested that more work is needed into the development of biological control agents and the use of sterilisation agents for all invasive species.[51] Indeed, WWF-Australia suggested that biological controls are the 'only enduring solution' for invasive species is:

> Conservation investment is best directed at selecting and releasing effective biocontrol agents such as calicivirus in rabbits, or the salvinia weevil, rather than never-ending and expensive spraying, shooting, baiting and other direct control measures.[52]

Weeds

4.32 In relation to weeds, the committee received evidence of a number of measures to address the problem, including the Australian Weeds Strategy, under which the List of Weeds of National Significance (WONS) is established.[53] However, Dr Carol Booth of the Invasive Species Council expressed the view that the Australian Weeds Strategy 'is ignored'.[54] Others reported that funding has been cut for implementing strategies relating to the Weeds of National Significance.[55]

4.33 Some submitters noted legislation at the state level which obliges landholders to control some weeds, based on their status as declared 'pest plants'.[56]

4.34 The committee also notes that the Commonwealth government has committed $15.3 million over four years, from 2008-09 for the National Weeds and Productivity Research Program. The program will fund research 'into biocontrols and tools that will reduce the impact of invasive plants on farm and forestry productivity and also on biodiversity'.[57]

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50 SEWPAC, *Answers to questions on notice from public hearing*, 15 February 2013, p. 15 [Q. 14]; cf Mr Frank Manthey, Save the Bilby Fund, *Committee Hansard*, 22 February 2013, p. 2.

51 Colong Foundation for Wilderness, *Submission 43*, p. 7; see also Arid Lands Environment Centre, *Submission 151*, p. 2.

52 WWF-Australia, *Submission 81*, p. 4.

53 SEWPAC, *Submission 143*, p. 8; Minister for Environment and Heritage Protection Queensland, *Submission 130*, p. 3.

54 Dr Carol Booth, Invasive Species Council, *Committee Hansard*, 22 February 2013, p. 8.

55 S. Burgess and E. Bradley, *Submission 101*, p. 1; Mary River Catchment Coordinating Committee, *Submission 115*, p. 2.

56 Minister for Environment and Heritage Protection Queensland, *Submission 130*, p. 3.

57 See further Department of Agriculture, Forestry and Fisheries, *Weeds Management*, available at: http://www.daff.gov.au/natural-resources/invasive/weeds (accessed 29 April 2013).

4.35 The Invasive Species Council noted that 'escaped nursery plants' were listed as a 'key threatening process' under the EPBC Act, but that 'this has no practical effect in preventing the sale of unsafe plants'. No threat abatement plan has been developed and 'trade in the majority of unsafe nursery plants remains unregulated in most state and territory jurisdictions'.[58] By way of example, the Invasive Species Council submitted that 'of 340 ranked environmental weeds in NSW, about 90% can be sold or planted in part or all of NSW'.[59] The committee further notes that the advice to the Minister in relation to the 'escaped nursery plants' listing cited a number of 'serious invasive garden plants', such as Asparagus Fern (*Asparagus scandens*), Broom (*Genista* spp.), Fountain Grass (*Pennisetum setaceum*), Gazania (*Gazania linearis*), Glory Lily (*Gloriosa superba*), Japanese Honeysuckle (*Lonicera japonica*), Pepper tree (*Schinus areira*), Periwinkle (*Vinca major*) and Sweet Pittosporum (*Pittosporum undulatum*), that were still available for sale at Australian nurseries in some states at the time of listing.[60]

4.36 Note that the process of listing key threatening processes and threat abatement plans under the EPBC Act are discussed later in this chapter.

Government responses to invasive species

4.37 The committee notes that this committee's predecessor, the Environment, Communications, Information Technology and the Arts References Committee, considered the invasive species threat in detail in its 2004 report "Turning back the tide—the invasive species challenge".[61] The extent to which that report's recommendations have been implemented was not examined during this inquiry. However, the committee notes that some recommendations have not been implemented—for example, the recommendation that regulations be promulgated under section 301A of the EPBC Act to prohibit the trade in invasive plants species.[62] This is discussed further later in this chapter.

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58 Invasive Species Council, *Submission 140*, p. 9.

59 Invasive Species Council, *Submission 140*, p. 11, citing Paul Downey, Tim Scanlon and John Hosking, "Prioritizing Weed Species Based on Their Threat And Ability to Impact on Biodiversity: A Case Study from New South Wales", *Plant Protection Quarterly*, 2010, vol. 25, no. 3, pp 111–126.

60 Advice to the Minister for the Environment, Heritage and the Arts from the Threatened Species Scientific Committee (the Committee) on Amendments to the List of Key Threatening Processes under the Environment Protection and Biodiversity Conservation Act 1999, pp 4–5, at : http://www.environment.gov.au/biodiversity/threatened/ktp/pubs/garden-plants-listing-advice.pdf (accessed 2 August 2013).

61 Senate Environment, Communications, Information Technology and the Arts References Committee, *Turning back the tide – the invasive species challenge, report on the regulation, control and management of invasive species and the Environment Protection and Biodiversity Conservation Amendment (Invasive Species Bill)*, December 2004.

62 Senate Environment, Communications, Information Technology and the Arts References Committee, *Turning back the tide – the invasive species challenge, report on the regulation, control and management of invasive species and the Environment Protection and Biodiversity Conservation Amendment (Invasive Species Bill)*, December 2004, recommendation 6, p. 215.

4.38 During this inquiry, the committee heard that environmental biosecurity needs to be given the same priority treatment as agriculture biosecurity.[63] For example, the Invasive Species Council commented that 'environmental biodiversity currently lags far behind agricultural biosecurity'.[64] Dr Booth suggested that environmental biosecurity needs to be given higher priority:

> …we need to bring environmental biosecurity up to the same standards so that the contingency planning, the prioritisation, the strategies, the resources, the research, the monitoring et cetera that go to primary industries also go to the environment.[65]

4.39 In response to questioning, SEWPAC advised that the impact of feral animals 'are examined in conservation advices and/or recovery plans for specific threatened species, and in threat abatement plans and their associated background documents'.[66]

4.40 More generally, SEWPAC told the committee that the 'Australian Government works closely with state and territory governments on policies designed to reduce the impact of feral animals.' SEWPAC pointed to the Vertebrate Pests Committee, which is 'responsible for overseeing implementation of the Australian Pest Animal Strategy and for developing nationally relevant policy and advice to minimise the impacts and risks from established, emerging and potential vertebrate pest animals in Australia'.[67] SEWPAC also stated that the government 'also participates in the development of national plans to help manage feral animals'.[68]

4.41 SEWPAC also told the committee that a 'targeted investment approach' to reduce the impacts of invasive species was being made under programs such as Caring for Our Country, the Environmental Stewardship Program and the Biodiversity Fund:

> These programs provide targeted funding for invasive species management in order to lessen the impacts upon threatened species and communities. Under Caring for our Country and the Environmental Stewardship Program, this has included more than $107 million in investments to eradicate weeds and pests and protect threatened and endangered species. Under the Biodiversity Fund, actions to control invasive species should form part of every project.[69]

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63 Australian Wildlife Health Network, *Submission 108,* p. 2.

64 Invasive Species Council, *Submission 140*, p. 12; see also Dr Emma Rooksby and Dr Keith Horton, *Submission 41*, p. 2.

65 Dr Carol Booth, Invasive Species Council, *Committee Hansard*, 22 February 2013, p. 11.

66 SEWPAC, *Answers to questions on notice from public hearing*, 15 February 2013, p. 15 [Q.14].

67 SEWPAC, *Answers to questions on notice from public hearing*, 15 February 2013, p. 15 [Q.14].

68 SEWPAC, *Answers to questions on notice from public hearing*, 15 February 2013, p. 15 [Q.14].

69 SEWPAC, *Answers to questions on notice from public hearing*, 15 February 2013, p. 24 [Q.21].

Disease

4.42 Several organisations raised the need for greater recognition of disease as a threatening process for many species.[70] For example, the Australian Wildlife Health Network outlined some of the key diseases threatening native species:

> The identification of chytridiomycosis, a disease of amphibians causing extinctions around the world and in Australia took 19 years; identification of Tasmanian Devil Facial Tumour took 10 years – because of this disease there is a real threat that Tasmanian Devils may become extinct in the wild in the next 25 years. Psittacine beak and feather disease and chlamydiosis are two other diseases presenting decision making challenges to the good work of the Orange-bellied parrot recovery team and those working with Koalas.[71]

4.43 It was suggested that there is a need for increased focus on disease as a threatening process, including disease risk assessment and mitigation.[72] The Australian Wildlife Health Network suggested that 'there is a need to invest in monitoring and increasing capacity for rapid response for wildlife diseases that impact upon biodiversity.'[73] They called for better funding for wildlife disease management, as well as long term commitment to improved coordination and cross jurisdictional integration.[74]

4.44 As discussed earlier in relation to invasive species, it was suggested that environmental biosecurity needs to be prioritised in the same way as agricultural biosecurity.[75] For example, the Australian Wildlife Health Network emphasised that:

> Prevention of disease outbreaks is a far more cost-effective method than attempting to control outbreaks or eradicate disease. Australia's national early warning, surveillance system for wildlife health needs to include diseases that may impact on biodiversity.[76]

4.45 Similarly, the Wildlife Disease Association Australasia lamented the lack of a 'coordinated, supported approach to incorporating wildlife health and disease efforts into threatened species responses'.[77] They suggested that there is 'poor utilisation of

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70 Zoo and Aquarium Association, *Submission 27*, p. 1; Australian Wildlife Health Network, *Submission 108*; Wildlife Disease Association Australasia, *Submission 117*, p. 1.

71 Australian Wildlife Health Network, *Submission 108,* p. 2.

72 See, for example, Zoo and Aquarium Association, *Submission 27*, p. 1; Australian Wildlife Health Network, *Submission 108*, p. 2.

73 Australian Wildlife Health Network, *Submission 108,* p. 3.

74 Australian Wildlife Health Network, *Submission 108,* p. 4.

75 Australian Wildlife Health Network, *Submission 108,* p. 2.

76 Australian Wildlife Health Network, *Submission 108,* p. 3.

77 Wildlife Disease Association Australasia, *Submission 117*, p. 1.

existing wildlife health and disease expertise in Recovery Teams, Threat Abatement Plans and other risk assessments'.[78]

4.46 It is noted that only two diseases are listed as key threatening processes under the EPBC Act: Psittacine beak and feather disease and chytridiomycosis. Listed key threatening processes and their associated threat abatement plans are discussed further later in this chapter.

Climate change

4.47 Several submissions raised the issue of climate change, which is thought likely to exacerbate the other threats.[79] For example, Professor Woinarski expressed the view that 'over the next 10 to 20 years climate change is going to exacerbate many of the existing threats…'.[80]

4.48 The committee heard that climate change may pose additional challenges to managing key threats to threatened species and ecological communities in the future. The CSIRO pointed to recent research which indicates that:

> …climate change could lead to widespread environmental change that is very ecologically significant. Climate change could 'lead to most places in Australia having, by 2070, environments that are more ecologically different from current conditions than they are similar'.[81]

4.49 CSIRO warned that 'where rates of environmental change exceed the ability of biodiversity to adapt or migrate', this could lead to significant losses of biodiversity and species extinctions. CSIRO expressed the view that the 'the number of listed species under climate change is expected to dramatically increase' and that this has important implications for policies and processes relating to threatened species.[82]

4.50 CSIRO concluded that 'there would be benefit in planning now for effectiveness of threatened species and ecological communities' protection…in the context of a changing climate'.[83]

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78 Wildlife Disease Association Australasia, *Submission 117*, p. 1.

79 WWF-Australia, *Submission 81*, p. 4; CSIRO, *Submission 77*, pp 6–7; ACF, *Submission 147*, p. 3; Invasive Species Council, *Submission 140*, p. 6; Mr Peter Cosier, Wentworth Group of Concerned Scientists, *Committee Hansard*, 15 February 2013, p. 35; Professor Lee Godden, *Committee Hansard*, 20 February 2013, p. 11; Invasive Species Council, *Submission 140*, p. 6; Clarence Environment Centre, *Submission* 63, p. 4; Dr Chris McGrath, *Submission 78*, pp 1–2; The Wilderness Society, *Submission 129*, pp 1–2; Nature Conservation Council of NSW, *Submission 134*, p. 3.

80 Professor John Woinarski, *Committee Hansard*, 7 March 2013, p. 5.

81 CSIRO, *Submission 77*, p. 6, citing Dunlop M., Hilbert D.W., Ferrier S., House A., Liedloff A., Prober S.M., Smyth A., Martin T.G., Harwood T., Williams K.J., Fletcher C., and Murphy H. 2012. *The Implications of Climate Change for Biodiversity Conservation and the National Reserve System: Final Synthesis*. A report prepared for SEWPAC, and the Department of Climate Change and Energy Efficiency. CSIRO Climate Adaptation Flagship, Canberra.

82 CSIRO, *Submission 77*, p. 8.

83 CSIRO, *Submission 77*, p. 9.

4.51 Several witnesses also pointed to a recent report by Professor Will Steffen and others which examined the vulnerability of Australia's biodiversity to climate change.[84] Mr Graham Tupper from the Australian Conservation Foundation (ACF) told the committee that that report:

> …shows that a new approach is needed that looks at cumulative impact and that looks at whole-of-ecosystems and landscape scale and so on.[85]

4.52 Mr Peter Cosier of the Wentworth Group of Concerned Scientists suggested that we need to recognise this threat in planning processes, and also that we 'need not only to restore parts of the landscape now but to take into account that the climate in that landscape might change. The jargon word is "resilience"':

> But it is just a word that people use; it is not actually being done, except in probably two or three incidences in Australia, where scientists are going in and having a look at the resilience of the various components of the ecosystems and identifying what needs to be put in place to ensure that they can deal with these extreme events.[86]

4.53 Mr Cosier continued:

> A basic biological issue is that species do not go extinct in average years. They go extinct when you have extreme climate events. An example is from one of our Wentworth Group members who has studied the Carnaby's cockatoo in Western Australia. They drop dead when the temperature hits 42 degrees. They have been hanging on for years but if the climate change moves in there the species will be wiped out in one day.[87]

4.54 ANEDO observed that its analysis had:

> …found a consistent gap in most laws regarding the threat of climate change to listed species and communities. Very few laws explicitly recognise and provide strategies to ameliorate the impacts of climate change, assist adaptation (where possible) and build species' resilience.[88]

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84 See, for example, ACF, *Submission 147*, p. 5, citing Steffan, W. (et al) *Australia's Biodiversity and Climate Change: Summary for Policy makers 2009*, Australian Government, Department of Climate Change, Canberra 2009.

85 Mr Graham Tupper, ACF, *Committee Hansard*, 15 February 2013, p. 23; also Ms Claire Parkes, Wentworth Group of Concerned Scientists, *Committee Hansard*, 15 February 2013, p. 35.

86 Mr Peter Cosier, Wentworth Group of Concerned Scientists, *Committee Hansard*, 15 February 2013, p. 36.

87 Mr Peter Cosier, Wentworth Group of Concerned Scientists, *Committee Hansard*, 15 February 2013, p. 36.

88 ANEDO, *Submission 137*, p. 3; and see also additional information provided by the Australian Network of Environmental Defenders' Offices: *Report on Climate change and the legal framework for biodiversity protection in Australia: a legal and scientific analysis* (from public hearing, Canberra, 15 February 2013).

4.55 When questioned as to how the possible impacts of climate change on threatened species and ecological communities are being incorporated into decision-making under the EPBC Act, SEWPAC responded:

> If considered a threat, the impact of climate change is specifically covered in individual listing and/or conservation advices, including in the outline of threats, analysis against listing criteria and recommended priority research actions. As an example, the threat of rising sea temperatures was covered as a specific threat that contributed to the listing of 'Giant Kelp Marine Forests of South East Australia' in August 2012.[89]

4.56 SEWPAC also advised that the potential impacts of climate change are recognised in recovery and threat abatement plans where relevant:

> For example, the draft threat abatement plan for disease in natural ecosystems caused by *Phytophthora cinnamomi* has a section…about the potential effect of climate change on the distribution and expression of the pathogen.[90]

4.57 SEWPAC also noted that greater flexibility in developing and implementing threat abatement plans, including a regional or landscape approach to threat abatement may assist in addressing climate change adaptation issues.[91]

4.58 SEWPAC concluded that climate change is a 'threat that is not easily managed', where 'global efforts are needed to abate the threat'.[92] However, it pointed the new Clean Energy Futures Biodiversity Fund, which it said will help to 'build resilience and restore habitat connectivity, as well as help manage threats that can have a compounding impact with climate change, such as invasive species.'[93]

4.59 The committee notes that the House of Representatives Standing Committee on Climate Change, Environment and the Arts has also recently conducted an inquiry into 'Australia's biodiversity in a changing climate'.[94]

Inappropriate fire regimes

4.60 Several submissions also raised the threat of inappropriate fire regimes.[95] For example, the Queensland Minister for Environment and Heritage Protection observed

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89 SEWPAC, *Answers to questions on notice from public hearing*, 15 February 2013, p. 14 [Q.13].

90 SEWPAC, *Answers to questions on notice from public hearing*, 15 February 2013, p. 14 [Q.13].

91 SEWPAC, *Answers to questions on notice from public hearing*, 15 February 2013, p. 14 [Q.13]; and see Hawke review, recommendation 20.

92 SEWPAC, *Submission 143*, Attachment A, p. 1.

93 SEWPAC, *Submission 143*, Attachment A, p. 1.

94 See further: House Standing Committee on Climate Change, Environment and the Arts, *Inquiry into Australia's biodiversity in a changing climate*, at: http://www.aph.gov.au/Parliamentary_Business/Committees/House_of_Representatives_Committees?url=ccea/ccbio/index.htm (accessed 28 March 2013).

that 'the fire regimes that threaten most listed species and communities in Queensland are those that are too frequent, too intense, and generally occur late in the dry season'.[96] The minister further submitted that:

> Fire management plans are prepared for many protected areas, and planned burn guidelines have also been prepared for Queensland bioregions…Fire guidelines for regional ecosystems are also included in the Regional Ecosystem Description Database…and fire management actions for wildlife conservation are included in a series of management guidelines for Broad Vegetation Groups…[97]

4.61 Mr Andrew Heaver noted that inappropriate fire regimes are recognised as a threat for several listed species—and as a 'threatening process' under the Victorian *Flora and Fauna Guarantee Act 1988*. He noted that while there has been a 'reasonable' amount of research relating to fire ecology and Australian *plant* communities, much less research is available on the relationships between *animal* species and fire regimes.[98]

4.62 Professor John Woinarski discussed the decline in biodiversity in Northern Australia, and argued that this was partly a result of 'poor fire management'.[99]

4.63 The committee also heard about a number of research projects examining the linkages between fire regimes and biodiversity declines.[100] For example, the Director of National Parks submitted that it commenced the Kakadu National Park Fire Plot Monitoring Program in 1995:

> The program aims to assess fire regimes, their impacts upon biodiversity and the consequences and efficacy of fire management. It is one of the few long-standing monitoring programs in an Australian protected area and was instrumental in the diagnosis of the decline of small mammals currently occurring across Australia's northern savannas.[101]

Interaction between key threats

4.64 The committee also received evidence that the key threats discussed above interact with each other. For example, climate change is likely to exacerbate the other

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95 See, for example, East Gippsland Wildfire Taskforce, *Submission 11*; Save the Bilby Fund, *Submission 16*, p. 1; Arid Lands Environment Centre, *Submission 151*, p. 1; Department of Land Resource Management, NT Government, *Submission 159*, p. 1; Friends of Hoddles Creek, *Submission 109*. For further discussion and explanation of changed fire regimes, see the Biodiversity Strategy, pp 28–29.

96 Queensland Minister for Environment and Heritage Protection, *Submission 130*, p. 2.

97 Queensland Minister for Environment and Heritage Protection, *Submission 130*, p. 2.

98 Mr Andrew Heaver, *Submission 119*, p. 2.

99 Professor John Woinarski, *Committee Hansard*, 7 March 2013, pp 5 and 6.

100 Director of National Parks, *Submission 144*, p. 8.

101 Director of National Parks, *Submission 144*, pp 5–6; see also Premier of Western Australia, *Submission 169*, p. 12.

threats. Other examples include, inappropriate fire regimes increasing the vulnerability of small mammals to predation by feral animals such as cats;[102] or the spread of exotic pasture grasses impacting on fire regimes.[103] The committee heard that 'threats typically interact in complex, cumulative and unexpected ways'.[104]

4.65 As the Director of National Parks warned:

> There is a risk of perverse outcomes arising from biodiversity interventions, meaning that actions to protect a given species may unknowingly come at the expense of others or at the expense of overall ecosystem function.[105]

4.66 The Director gave the example of successful program to control foxes in Booderee National Park, which has 'has seen the recovery in populations of threatened or significant species known to be at risk from fox predation'. However, the Director reported that there have been 'unanticipated declines' in the park's populations of arboreal marsupials since fox baiting. It was thought this may have been an unexpected consequence, possibly in part through increases in populations of two owl species (themselves the subject of conservation concern).[106]

4.67 A similar example raised was the complex relationship between dingoes and other feral animals.[107] It was revealed to the committee that there is 'increasing evidence' that 'taking dingoes and foxes out of an environment then leads to an increase in feral cat numbers'.[108] Indeed, WWF-Australia suggested that stopping the suppression of dingoes and other wild dogs might help to provide a 'more enduring biological form of regulation' of feral cats, foxes, goats and pigs, rather than 'high cost baiting programs that also affect native animals'.[109]

4.68 The Director of National Parks concluded that, at least in relation to national park management:

> The potential for perverse outcomes demonstrates the need to actively support research and monitoring programs that improve understanding of multi-species interactions...[110]

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102 Invasive Species Council, *Submission 140*, p. 5.

103 Dr Carol Booth, Invasive Species Council, *Committee Hansard*, 22 February 2013, p. 9; see also Invasive Species Council, *Submission 140*, pp 4–5.

104 SEWPAC, *Submission 143*, Attachment A, p. 1.

105 Director of National Parks, *Submission 144*, p. 9.

106 Director of National Parks, *Submission 144*, p. 9.

107 See, for example, Colong Foundation for Wilderness, *Submission 43*, pp 11–12.

108 Dr Andrew Burbidge, *Committee Hansard*, 7 March 2013, p. 4; see also Save the Bilby Fund, *Committee Hansard*, 22 February 2013, p. 5.

109 WWF-Australia, *Submission 81*, p. 4; see also Colong Foundation for Wilderness, *Submission 43*, p. 7.

110 Director of National Parks, *Submission 144*, p. 10.

Legacy effect

4.69 The so-called 'legacy effect' creates additional challenges for management and protection of threatened species and ecological communities. That is, past actions will continue exert pressures on the environment into the future.[111] As Director of National Parks submitted:

> …many of the most pressing threatening processes that operate today are the result of deliberate or unintentional land-use and societal decisions made long ago; historical land clearing and introduced invasive species are prime examples.[112]

4.70 As the Invasive Species Council commented, 'the majority of introduced species already in Australia are yet to achieve the full extent of their potential spread and density'.[113]

4.71 The 2011 Commonwealth State of the Environment report notes that 'addressing these legacy effects will be complex, long term and potentially expensive'.[114]

Managing multiple threats

4.72 It was suggested that focussing on managing the threats common to many threatened species might be a more effective approach than individual species recovery planning. For example, Dr Andrew Burbidge told the committee that Australia should 'focus on a small number of pervasive, key threats that affect a large number of species and adequately resource these threats.'[115] He named cats, foxes and phytophthora as three key threats which require significant research to resolve.[116] He suggested that they might require 'high-tech genetic engineering biological technology science to solve them'.[117]

4.73 Similarly, Zoos Victoria submitted that:

> We would emphasize that many threatened species share common threats (e.g. chytrid fungus impacting numerous frog species and predation on small mammals and grounddwelling birds by foxes), and thus effective threat management will benefit multiple threatened species and other biodiversity.[118]

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111 SEWPAC, *Submission 143*, p. 3.

112 Director of National Parks, *Submission 144*, pp 8–9.

113 Invasive Species Council, *Submission 140*, p. 5; quoting Low, T. 1999 *Feral Future: The Untold Story of Australia's Exotic Invaders*. Penguin.

114 SEWPAC, *Australian State of the Environment Report 2011*, p. 627.

115 Dr Andrew Burbidge, *Committee Hansard*, 7 March 2013, p. 1; see also Dr Andrew Burbidge, *Submission 46*, p. 1.

116 Dr Andrew Burbidge, *Committee Hansard*, 7 March 2013, p. 1.

117 Dr Andrew Burbidge, *Committee Hansard*, 7 March 2013, p. 1.

118 See, for example, Zoos Victoria, *Submission 42*, p. 2.

4.74 Mr Atticus Fleming from the Australian Wildlife Conservancy identified feral animals and fire regimes as the two biggest threats and suggested that government funding should focus on investing in on-ground projects to address those two threats.[119]

4.75 The Director of National Parks suggested that this was a good reason for focussing on landscape scale approaches:

> A significant number of the threats that face Australia's biodiversity in our threatened species often occur at a wide landscape scale—that is, things like fragmentation of habitat, invasive species, changes in hydrology. Those types of things impact threatened species habitat across the broader landscape.[120]

4.76 The committee notes that landscape approaches are considered further in Chapter 5 of this report.

4.77 However, the Director of National Parks also warned that 'simple conclusions about species decline and potential causes need to be treated cautiously':[121]

> The factors causing the decline of species, whether or not they are listed as threatening, are often complex and not necessarily well understood.[122]

4.78 Some expressed despair at current success rates in relation to key threats. For example, The Save the Bilby Fund felt that there are 'dishearteningly few examples of threats to an existing threatened species being mitigated to the extent that they no longer have a negative impact on that species'.[123]

4.79 In the same vein, Ms Rachel Lowry from Zoos Victoria felt that 'the threats that are actually driving the pressures on these species are very rarely addressed in a timely and appropriate manner.'[124]

4.80 In contrast, Professor Stephen Garnett from BirdLife Australia expressed the view that 'Australia has been remarkably successful in many ways over the last 20 years since it became conscious of threatened species'.[125]

4.81 BirdLife Australia cited a number of success stories which have involved managing or removing key threats.[126] However, BirdLife Australia and others also argued that sufficient resources and funding to manage key threats is vital:

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119 Mr Atticus Fleming, Australian Wildlife Conservancy, *Committee Hansard*, p. 19.

120 Director of National Parks, *Committee Hansard*, 15 February 2013, p. 62. Note that landscape-scale approaches are discussed further in Chapter 6 of this report.

121 Director of National Parks, *Committee Hansard*, 15 February 2013, p. 62.

122 Director of National Parks, *Committee Hansard*, 15 February 2013, p. 61.

123 Save the Bilby Fund, *Submission 16*, p. 1.

124 Ms Rachel Lowry, Zoos Victoria, *Committee Hansard*, 20 February 2013, p. 2.

125 Professor Stephen Garnett, BirdLife Australia, *Committee Hansard*, 20 February 2013, p. 7; see also BirdLife Australia, *Submission 82*, p. 1.

126 BirdLife Australia, *Submission 81*¸ pp 1–4.

> Funding must be adequate. If too little money is provided then any gains are likely to be reversed rapidly or the knowledge obtained about the threatened species will be inadequate to mitigate threats. This can lead to an impression that funding spent on recovery activities have been ineffective. Substantial funding over extended periods can result in an improved status that can often be sustained with minimal input.[127]

4.82 The Nature Conservation Society of South Australia also highlighted the successes in threat abatement management programs in South Australia. The Society submitted that, where programs to reduce feral goats and foxes have been in place, there has been a significant increase in numbers of the yellow-footed rock wallaby.[128] However, the Society also warned that ongoing funds will be needed:

> …the areas where threats are currently managed only cover approximately 30% of the known colonies… Due to the high mobility of both feral goats and foxes and inability to completely eradicate them from the landscape, ongoing funds will be required to maintain the biodiversity gains achieved and protect previous investment.[129]

4.83 Several submissions expressed concern that there is insufficient funding for management actions to control threats to threatened species and communities. And as Dr Burbidge observed, 'without adequate resourcing, the key threats that affect a wide variety of Australian species will not be ameliorated'.[130]

4.84 The Invasive Species Council advised felt that management of invasive species has generally been ineffective and uncoordinated. It submitted that 'to stabilise and reduce environmental impacts of invasive species will require addressing multiple weaknesses in Australia's biosecurity system'. Some of the concerns highlighted by Invasive Species Council are discussed elsewhere in this report, including the provisions for key threatening processes and funding issues.[131]

4.85 However, SEWPAC pointed out that 'under Caring for Our Country, funding is available for landscape-scale projects which aim to abate key threats to biodiversity and protect various habitat types'. They gave the example of a $19 million investment made into Feral Camel Management project; $10 million to combat decline in Tasmanian Devils; $200 million for 'Reef Rescue' to improve water quality in the Great Barrier Reef which it argued would benefit threatened species found within the Great Barrier Reef.[132]

4.86 Funding in relation to threatened species protection and management is discussed further in Chapter 6.

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127 BirdLife Australia, *Submission 82*, p. 7.

128 Nature Conservation Society of South Australia, *Submission 150*, p. 2.

129 Nature Conservation Society of South Australia, *Submission 150*, p. 2.

130 Dr Andrew Burbidge, *Submission 46*, p. 1; see also HSI, *Submission 88*, p. 2.

131 Invasive Species Council, *Submission 140*, p. 7.

132 SEWPAC, *Answers to questions on notice from public hearing*, 15 February 2013, p. 18 [Q.17].

4.87 Mr Andrew Heaver observed that 'there remain substantial gaps in our knowledge of threatening processes—gaps which, unless resolved, are likely to hinder effective management.'[133] He was concerned that, for example, there has not been enough research relating to the impacts of 'inappropriate' fire regimes on threatened animal species.[134]

4.88 The Director of National Parks acknowledged:

> Responding to biodiversity threats may require acting without waiting for more complete knowledge. Inadequate information however can compromise the effectiveness and success of management actions.[135]

4.89 The need for further research and monitoring in relation to threatened species and their management is discussed further in Chapter 6.

4.90 The Director of National Parks outlined a range of activities being undertaken in the six national parks managed by Parks Australia to address key threats to threatened species, including, for example, measures to control invasive species and fire management programs as well as monitoring and research programs to assess the effectiveness of these actions.[136]

4.91 CSIRO told that committee that the Centre of Excellence in Environmental Decision-making[137] has developed 'a recognized, multi-disciplinary science-based process for decision making for management actions for biodiversity conservation':

> This process is based on structured decision making and systematic conservation planning. In Australia this process has been applied successfully to management actions around key threats and threatening processes for listed species in the Kimberley, and is now the focus of a much larger CSIRO study for the Pilbara where the inclusion of threats to listed ecological communities is also being considered…This process can help to integrate the management of specific threats such as particular feral predators with landscape processes like fire and grazing management.[138]

4.92 CSIRO suggested that this approach should be used for prioritising threat management of listed species and ecological communities:

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133 Mr Andrew Heaver, *Submission 119*, p. 2.

134 Mr Andrew Heaver, *Submission 119*, p. 2.

135 Director of National Parks, *Submission 144*, p. 10.

136 Director of National Parks, *Submission 144*, see especially pp 12–15.

137 See further www.ceed.edu.au (accessed 15 April 2013). The Centre is supported by the Australian Government Australian Research Council.

138 CSIRO, *Submission 77*, p. 2, citing Julien M., Runge M.C., Nichols J.D., Lubow B.C. and Kendall W.L. 2009 "Structured decision making as a conceptual framework to identify thresholds for conservation and management" *Ecological Applications* 19: 1079–1090; and Margules, C.R. and Pressey R.L. 2000. "Systematic Conservation Planning" *Nature* 405: 243–253.

> Currently, most management outcomes tend to relate to the use of fire management, reduced grazing management and reducing the threats caused by non-native feral pest animals, weeds and diseases. With broad recognition of the key threat feral animals and weeds (e.g. buffel grass) pose to many listed species and increasing recognition that many of the impacts of such species will be exacerbated under climate change, most management options of the threats to particular listed species and communities tend to focus around the management of the impacts of these invasive species…. A structured decision making process could be more broadly applied to ensure long-term improvements in management decisions.[139]

4.93 Citing the examples of climate change and historic vegetation clearing, SEWPAC observed that 'abating all threats affecting threatened species is not always feasible or an efficient use of scarce conservation resources'.[140] However, it submitted that the department is 'pursuing a strategic, prioritised and multi-pronged approach to mitigate threats to species and biodiversity'.[141]

Listing key threatening processes and threat abatement planning

4.94 As outlined in Chapter 1, the EPBC Act provides for the identification and listing of 'key threatening processes'. Once a threatening process is listed, a threat abatement plan (TAP) *may* be put into place if it is shown to be 'a feasible, effective and efficient way' to abate the threatening process. Threat abatement plans establish 'a framework to guide and coordinate Australia's response to the impact of a key threatening process'.[142] They must provide for the research, management, and any other actions necessary to reduce the impact of a listed key threatening process on native species and ecological communities.[143]

4.95 As of April 2013, at the Commonwealth level, there were 20 listed key threatening processes and 13 approved threat abatement plans in place under the EPBC Act. These are set out in the table below.[144]

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139 CSIRO, *Submission 77*, p. 3.

140 SEWPAC, *Submission 143*, p. 3.

141 SEWPAC, *Submission 143*, p. 3.

142 SEWPAC, *Submission 143*, p. 5.

143 EPBC Act, ss 183, 270A–284.

144 Table compiled using information sourced from SEWPAC, *Key threatening processes under the EPBC Act*, at: http://www.environment.gov.au/biodiversity/threatened/ktp.html (accessed 2 April 2013).

Table 5: Listed key threatening processes and threat abatement plans (TAP) in place under the EPBC Act

Listed Key Threatening Process	**Date listed**	**TAP/date of TAP**
Competition and land degradation by rabbits	16-Jul-2000	Yes, 2008.
Competition and land degradation by unmanaged goats	16-Jul-2000	Yes, 2008.
Dieback caused by the root-rot fungus (*Phytophthora cinnamomi*)	16-Jul-2000	Yes, 2001. And a draft TAP open for comment in 2013.
Incidental catch (bycatch) of Sea Turtle during coastal otter-trawling operations within Australian waters north of 28 degrees South	04-Apr-2001	No.
Incidental catch (or bycatch) of seabirds during oceanic longline fishing operations	16-Jul-2000	Yes, 2006.
Infection of amphibians with chytrid fungus resulting in chytridiomycosis	23-Jul-2002	Yes, 2006.
Injury and fatality to vertebrate marine life caused by ingestion of, or entanglement in, harmful marine debris	13-Aug-2003	Yes, 2009.
Invasion of northern Australia by Gamba Grass and other introduced grasses	16-Sep-2009	Yes, 2012.
Land clearance	04-Apr-2001	No.
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants.	08-Jan-2010	No.
Loss of biodiversity and ecosystem integrity following invasion by the Yellow Crazy Ant (*Anoplolepis gracilipes*) on Christmas Island, Indian Ocean	12-Apr-2005	Covered by Action Plan for Invasive Ants on Christmas Island and TAP for 'tramp ants', 2006.
Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases	04-Apr-2001	No.
Novel biota and their impact on biodiversity	26-Feb-2013	No.
Predation by European red fox	16-Jul-2000	Yes, 2008.
Predation by exotic rats on Australian offshore islands of less than 1000 km^2 (100,000 ha)	29-Mar-2006	Yes, 2009.
Predation by feral cats	16-Jul-2000	Yes, 2008.

Listed Key Threatening Process	Date listed	TAP/date of TAP
Predation, Habitat Degradation, Competition and Disease Transmission by Feral Pigs	06-Aug-2001	Yes, 2005.
Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species	04-Apr-2001	Yes, 2005.
The biological effects, including lethal toxic ingestion, caused by Cane Toads (*Bufo marinus*).	12-Apr-2005	Yes, 2011.
The reduction in the biodiversity of Australian native fauna and flora due to the red imported fire ant, *Solenopsis invicta* (fire ant)	02-Apr-2003	Covered by TAP for 'tramp ants', 2006.

4.96 The committee notes that this list largely reflects the evidence received during this inquiry of the key threats to threatened species and ecological communities—with the exception perhaps of inappropriate fire regimes.

4.97 The focus of this report is on key threatening processes and threat abatement planning under the EPBC Act. However, it is noted that several states and territories also keep lists of key threatening processes. In relation to other jurisdictions, ANEDO submitted that:

> Identifying key threats to listed species and communities is fundamentally important and yet no State or Territory currently has a comprehensive list of threats legally recognised.
>
> The relevant laws in jurisdictions such as NSW, Tasmania and the Commonwealth recognise and provide for the listing of key threatening processes and making of threat abatement plans. Other states, such as South Australia and Western Australia do not have any specific legislative provisions to list threats or to guide threat abatement that may be undertaken.[145]

4.98 ANEDO further observed that even in jurisdictions which have legal provisions to formally recognise threats, 'key provisions are often discretionary…time frames for action and performance indicators are largely absent across Australia'.[146]

Key threatening processes: the nomination and listing process

4.99 The listing process for key threatening processes (KTPs) under the EPBC Act was criticised by submitters for being ineffective, lacking in transparency and/or too slow.[147] For example, Professor Woinarski believed that:

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145 ANEDO, *Submission 137*, p. 3 cf Premier of Western Australia, *Submission 169*.

146 ANEDO, *Submission 137*, p. 3.

147 See, for example, Professor John Woinarski, *Submission 48*, p. 3; HSI, *Submission 88*, p. 2; Invasive Species Council, *Submission 140*, pp 8–9; Dr Carol Booth, *Committee Hansard*, 22 February 2013, p. 7; Name Withheld, *Submission 71*, p. 1 Dr Andrew Burbidge, *Committee Hansard*, 7 March 2013, p. 7.

> The practice of naming under legislation Key Threatening Processes is of limited effectiveness, and the policy framework within which amelioration of those KTPs is addressed is ill-conceived and largely ineffective.[148]

4.100 The Invasive Species Council felt that the capacity to declare KTPs and develop threat abatement plans under the EPBC Act 'has potential to be a major tool for addressing abating invasive species threats but is currently failing to deliver.'[149]

4.101 In terms of the slow listing process, analysis from the Invasive Species Council indicated that it takes, on average, 1.8 years to assess a key threatening process and 3.7 years to develop a threat abatement plan—an overall total of around six years.[150]

4.102 Similarly, HSI advised that many of its nominations for KTPs had taken 'at least three years from submission date to listing' and that one of its nominations, submitted in October 2005, 'is still under consideration by the Minister with a decision on the outcome repeatedly delayed and now scheduled for early 2013, eight years later'.[151]

4.103 The Invasive Species Council also criticised the nomination process as 'demanding' in terms of the work involved to compile the evidence required. The Council further told the committee that it had made two nominations which had been rejected. It felt that, in its experience, 'nominations are rejected for no legislatively valid reason and typically with no reasons provided'.[152] The Invasive Species Council concluded:

> Under the current opaque and underfunded arrangements, ISC won't make any further nominations because it has been a waste of scarce community time and resources. There should be a much more systematic approach to KTP listings to ensure that the major threats requiring national focus are recognised and acted on.[153]

4.104 The Invasive Species Council recommended that listing of KTPs needs to more systematic to 'properly reflect' the threats to biodiversity and TAPs be developed on a prioritised basis.[154]

4.105 The committee notes that recommendation 19 of the Hawke review, which was accepted by the government, included to amend the EPBC Act to better define

148 Professor John Woinarski, *Submission 48*, p. 3.

149 Invasive Species Council, *Submission 140*, p. 7.

150 Invasive Species Council, *Submission 140*, p. 8.

151 HSI, *Submission 88*, p. 2.

152 Invasive Species Council, *Submission 140*, p. 8.

153 Invasive Species Council, *Submission 140*, p. 9.

154 Invasive Species Council, *Submission 140*, p. 10.

KTPs; allow greater flexibility in the criteria for eligibility for listing a KTP; and allow strategic identification of KTPs at a range of scales.[155]

4.106 In terms of a more strategic approach to KTPs, the committee notes that, in February 2013, 'novel biota' was listed as a 'Key Threatening Process' under the EPBC Act to capture all invasive species. The term 'novel biota' refers to organisms that are new to an ecosystem whether by natural or human introduction, and therefore covers most invasive species.[156] The KTP listing covers six major groups of novel biota that are impacting on biodiversity, including:

- competition, predation or herbivory and habitat degradation by vertebrate pests;
- competition, predation or herbivory and habitat degradation by invertebrate pests;
- competition, habitat loss and degradation caused by terrestrial weeds;
- competition, habitat loss and degradation caused by aquatic weeds and algae;
- competition, predation or herbivory and habitat degradation by marine pests; and
- mortality, habitat loss and degradation caused by pathogens.[157]

4.107 The 'novel biota' listing therefore captures all existing KTPS listed under the EPBC Act.[158] The committee notes that threat abatement 'guidelines' have been developed for the novel biota KTP listing. These guidelines state that since the advent of the EPBC Act, many novel biota have been nominated for listing as a KTP, and:

> …the list has grown so large that individual evaluations could divert the Government's attention and resources for many years. Despite a wide range of legislation, plans, strategies and initiatives, the impacts of novel biota on Australian ecosystems are increasing.

155 Hawke review, recommendation 19, see also pp 167–169.

156 See further SEWPAC, *Novel biota and their impact on biodiversity*, at: http://www.environment.gov.au/biodiversity/threatened/ktp/novel-biota.html (accessed 30 July 2013).

157 *Advice to the Minister for Sustainability, Environment, Water, Population and Communities from the Threatened Species Scientific Committee (the Committee) on Amendments to the List of Key Threatening Processes under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*, p. 1, available at: http://www.environment.gov.au/biodiversity/threatened/ktp/pubs/novel-biota-listing-advice.pdf (accessed 30 July 2013).

158 *Advice to the Minister for Sustainability, Environment, Water, Population and Communities from the Threatened Species Scientific Committee (the Committee) on Amendments to the List of Key Threatening Processes under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*, p. 4, available at: http://www.environment.gov.au/biodiversity/threatened/ktp/pubs/novel-biota-listing-advice.pdf (accessed 30 July 2013).

> The current state legislative and management arrangements make timely and effective action cumbersome and unwieldy. If this continues, more species and ecological communities will be affected and the task of management will become more difficult.
>
> The Threatened Species Scientific Committee (the Committee) considers that there is a lack of consistent mechanisms for setting priorities to abate the threats posed by novel biota. Accordingly, the Committee proposes that all novel biota should be seen as a real or potential threat to native biodiversity, and that a new planning framework should be developed to integrate the responses to different species.[159]

4.108 However, this listing was criticised by the Invasive Species Council.[160] Dr Booth from the Invasive Species Council explained that two of their nominations for invasive species KTPs were rejected because they would be covered by the 'novel biota' KTP.[161] Dr Booth explained that their concern was that this 'one all-embracing listing' would not result in a threat abatement plan which would be 'completely useless'.[162] At the same time, the Invasive Species Council suggested that the listing could be used 'as the basis for developing, on a prioritised basis, multiple Threat Abatement Plans to address invasive species threats where these plans provide a feasible way to address threats'.[163]

Threat abatement planning

4.109 Listing of a key threatening process does not always result in the development of a threat abatement plan: sometimes a decision is made *not* to have a threat abatement plan, which some felt can make a KTP listing 'a bit pointless'.[164]

4.110 SEWPAC advised that:

> Threat abatement plans are underpinned by strong science and are important tools for raising public awareness about key threats to biodiversity, and best practice strategies and techniques to abate those threats.[165]

4.111 However, several submissions lamented the slow development of threat abatement plans, as well as their lack of funding and implementation (and their

159 SEWPAC, *Novel biota and their impact on biodiversity*, http://www.environment.gov.au/biodiversity/threatened/ktp/novel-biota.html (accessed 5 April 2013).

160 Invasive Species Council, *Submission 140*, p. 9.

161 Dr Carol Booth, Invasive Species Council, *Committee Hansard*, 22 February 2013, p. 10.

162 Dr Carol Booth, Invasive Species Council, *Committee Hansard*, 22 February 2013, p. 10.

163 Invasive Species Council, *Submission 140*, p. 10.

164 Dr Carol Booth, Invasive Species Council, *Committee Hansard*, 22 February 2013, p. 10.

165 SEWPAC, *Submission 143*, p. 5.

equivalents at the state or territory level).[166] For example, HSI submitted that once KTPs are listed:

> …the subsequent development of threat abatement plans, where these are required to be developed, is also a slow process which further delays implementation or amelioration of the threats on the ground.[167]

4.112 The Invasive Species Council was also critical of the slow development and poor implementation of threat abatement plans:

> When the Environment Minister does agree to develop a TAP, as well as taking an average of close to four years to develop, they are often poorly implemented. There is no regular review of progress made on goals and actions and TAPs are often left to languish long after their intended 5 year review date – presumably due to a lack of resources (there are currently seven TAPs > 5 years old). In most plans there is very little community involvement except through a formal consultation process.[168]

4.113 The Invasive Species Council concluded by recommending that sufficient funding be provided for assessment of KTPs and development of TAPs.[169] In terms of implementation and funding for threat abatement planning, the Invasive Species Council noted that threat abatement plans often depend on 'competitive short-term, project-specific grants programs. There is no TAP-specific funding stream and no guaranteed funding for any TAP priorities'.[170]

4.114 Despite these criticisms, Dr Booth of the Invasive Species Council nevertheless supported the concept of threat abatement planning:

> ...we would really like to see the key threatening process play a substantial role in addressing invasive species threats. The only way of addressing a lot of these threats is to do what threat abatement planning is meant to do, which is to bring together the players, agree on a plan, identify the priorities and then start implementing the actions that are needed to address these threats.[171]

4.115 Dr Burbidge expressed the view that the current responses to listings of 'Key Threatening Processes' are 'inadequate'. He gave two examples:

> Listings of threats such as 'Dieback caused by the root-rot fungus (Phytophthora cinnamomi)' and 'Predation by feral cats' (both major,

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166 Dr Andrew Burbidge, *Submission 46*, p. 1; HSI, *Submission 88*, p. 2; Invasive Species Council, *Submission 140*, p. 9; Clarence Valley Conservation Coalition, *Submission 38*, p. 4; Dr Rupert Baker, *Submission 141*, p. 1; Batwatch Australia, *Submission 139*, p. 2; CSIRO, *Submission 77*, p. 3; FrogWatch, *Submission 158*, p. 2; Professor John Woinarski, *Committee Hansard*, 7 March 2013, p. 7.

167 HSI, *Submission 88*, p. 2.

168 Invasive Species Council, *Submission 140*, p. 9.

169 Invasive Species Council, *Submission 140*, p. 9.

170 Invasive Species Council, *Submission 140*, p. 9.

171 Dr Carol Booth, Invasive Species Council, *Committee Hansard*, 22 February 2013, p. 10.

> insidious and ongoing threats to large numbers of species) have not resulted in significant, targeted scientific research funding or large-scale adaptive management projects to ameliorate the threats…There are attempts to manage these threats, but they are local and poorly resourced.[172]

4.116 Two submitters were highly critical of the lack of implementation of the threat abatement plan for Psittacine Circoviral (beak and feather) Disease, claiming that 'very little has been achieved in mitigating this threat'. It was alleged that twelve years after the adoption of the threat abatement plan, the five major objects of the plan 'have not been met'.[173] It was further remarked that the Working Group has not met since 2009; very few of the actions recommended in the plan have been carried out, and that the plan is overdue for review.[174]

4.117 In contrast, evidence was received of success stories in the listing of KTPs and development and implementation of threat abatement plans. Perhaps the most notable is measures taken by the fishing industry as a result of the listed KTP 'Incidental catch (or bycatch) of seabirds during oceanic longline fishing operations' and the associated threat abatement plan.[175] HSI argued that:

> Without the TAP driving things, it is doubtful tuna longline fisheries would have made any effort to mitigate their devastating impact on endangered albatross and petrels…[176]

4.118 Island Conservation discussed the listing of exotic rodents on islands as a KTP and the related threat abatement plan, and submitted that 'Australia is a world leader in the eradication of invasive species from islands at risk from rodents'.[177]

4.119 Where plans are implemented, the need for ongoing monitoring and evaluation of the threat abatement actions was emphasised in many submissions.[178]

4.120 For example, the National Parks Association of NSW felt that there is a need to increase accountability in terms of monitoring or reporting on the success of management actions taken in relation to threatened species, such as under threat abatement plans.[179]

4.121 The Invasive Species Council recommended that a review be undertaken of the effectiveness of TAPs over the past decade, assessing the extent to which actions have been implemented and the goals achieved.[180]

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172 Dr Andrew Burbidge, *Submission 46*, p. 1.

173 Dr Rupert Baker, *Submission 141*, p. 1.

174 Name withheld, *Submission 71*, p. 1.

175 Dr Andrew Burbidge, *Submission 46*, p. 1; HSI, *Submission 88*, p. 16.

176 HSI, *Submission 88*, p. 16.

177 Island Conservation, *Submission 20*, p. 2.

178 See, for example, Nature Conservation Society of South Australia, *Submission 150*, p. 2.

179 NPA NSW, *Submission 145*, pp 4–5.

180 Invasive Species Council, *Submission 140*, p. 10.

4.122 In response to criticisms about the slow development of TAPs, SEWPAC pointed to subsection 273(4) of the EPBC Act, which specifies that a TAP for a key threatening process must be made and in force within three years of the decision to have the plan. SEWPAC further advised that, when developing a plan, the department:

> …analyses new data, research and recent publications, and consults at length with experts from state agencies and research institutions in order that the draft plan reflects the most recent scientific knowledge and best practice management techniques. Having developed a draft plan, there are significant statutory prerequisites to finalising it. The Minister must:
>
> - consult with the appropriate Minister of each state and territory in which the key threatening process occurs and take their views into account;
> - obtain and consider the advice of the TSSC; and
> - consider comments received during a three month public consultation period and revise the plan to take account of those comments as necessary.[181]

4.123 SEWPAC further noted that it is moving to develop 'threat abatement advices', at the time of listing a key threatening process, in line with the recommendations of the Hawke review. Threat abatement advices will:

> …complement threat abatement plans by providing immediate guidance upon the listing of a key threatening process, and which can be updated as needed to reflect the most recent research outcomes and best practice in on-ground management.[182]

4.124 SEWPAC further advised that proposed amendments to the EPBC Act:

> …envisage a more flexible approach to threat abatement planning, particularly to allow for their development and implementation at regional scales.[183]

4.125 SEWPAC also remarked that, although the EPBC Act has not yet been amended, threat abatement guidelines are being prepared for some key threatening processes—for example, the listing advice for 'novel biota and its impact on biodiversity'.[184]

4.126 In relation to the implementation of threat abatement plans, SEWPAC informed the committee that:

> Threat abatement plans are not funding programs. A threat abatement plan establishes a framework to guide and coordinate Australia's response to the impact of a key threatening process. It enables all stakeholders to make informed investment in agreed national priorities for research, management

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181 SEWPAC, *Answers to questions on notice from public hearing*, 15 February 2013, p. 13 [Q.12]; and see Hawke review, recommendation 20.

182 SEWPAC, *Submission 143*, p. 6; see also SEWPAC, *Answers to questions on notice from public hearing*, 15 February 2013, p. 13 [Q.12].

183 SEWPAC, *Submission 143*, p. 6.

184 SEWPAC, *Answers to questions on notice from public hearing*, 15 February 2013, p. 13 [Q.12].

> and on-ground actions. The funding available to the department for threat abatement action is strategically applied to the highest priority areas across all threat abatement plans. Additional funds are available to stakeholders via the government programs Caring for our Country and the Biodiversity Fund, both of which have identified invasive species as a key element.[185]

Other mechanisms for dealing with key threatening processes

4.127 Another suggested mechanism, at least for dealing with invasive species, was the development and implementation of regulations under section 301A of the EPBC Act. This section provides for the establishment of a list of species, other than native species, that are likely to threaten biodiversity in Australia. Those species may be regulated or prohibited from being brought into Australia, or from being traded.

4.128 The Invasive Species Council argued that section 301A could be 'used to address in part the threats of several of the listed key threatening processes, in particular, escaped nursery plants'. [186]

4.129 The committee notes that this committee's predecessor, the Environment, Communications, Information Technology and the Arts References Committee, recommended in its 2004 report relating to invasive species that the Commonwealth, in consultation with the states and territories, promulgate regulations under section 301A of the EPBC Act to prohibit the trade in invasive plant species of national importance.[187] The government response to that report disagreed with that recommendation, stating that 'the Australian government considers that in the first instance states and territories should improve the management and control of weeds within their jurisdictions'.[188]

4.130 The Invasive Species Council pointed out that:

> The federal government has the capacity under the EPBC Act to regulate harmful activities involving invasive species but chooses not to use it.[189]

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185 SEWPAC, *Answers to questions on notice from public hearing*, 15 February 2013, p. 13 [Q.12].

186 Invasive Species Council, *Submission 140*, p. 9.

187 Senate Environment, Communications, Information Technology and the Arts References Committee, *Turning back the tide – the invasive species challenge, report on the regulation, control and management of invasive species and the Environment Protection and Biodiversity Conservation Amendment (Invasive Species Bill)*, December 2004, recommendation 6, pp 137–139, 155, 214–215.

188 Australian Government Response, to the Senate Environment, Communications, Information Technology and the Arts References Committee, *Turning back the tide – the invasive species challenge, report on the regulation, control and management of invasive species and the Environment Protection and Biodiversity Conservation Amendment (Invasive Species Bill)*, received September 2007, available at: http://www.aph.gov.au/Parliamentary_Business/Committees/Senate_Committees?url=ecita_ctte/completed_inquiries/2004-07/invasive_species/index.htm (accessed 28 March 2013).

189 Invasive Species Council, *Submission 140*, p. 9.

4.131 The Hawke review has also considered the potential for the use of 301A, and noted that:

> …while the exercise of this power [to make regulations] may help to manage the impact of invasive species, a compliance system incorporating state border controls would be required to make it effective…Although the compliance aspects of s.301A may be problematic, this provision provides an opportunity to create a new, targeted list of 'controlled' species, with the objective to regulate and/or prohibit actions involving non-native species that appear on this list. This could enable more effective interventions for some of the invasive species that are listed as KTPS.[190]

4.132 The Hawke review concluded that there may be value in exploring the potential use of s.301A in managing post-border regulation of invasive species.[191] The review then recommended that COAG:

> ...develop criteria and management protocols for the movement of potentially damaging exotic species between States and Territories, working towards a list of 'controlled' species for which cost-effective risk-mitigation measures may be implemented…[192]

4.133 The Commonwealth government agreed in part to this recommendation. The response noted that the draft Intergovernmental Agreement on Biosecurity [now finalised] 'provides a basis for further consideration of criteria and management protocols that might apply thought regulations developed under section 301A'.[193]

4.134 The committee notes that the Intergovernmental Agreement on Biosecurity was finalised in January 2012[194] and that the Biosecurity Bill 2012 and the Inspector-General of Biosecurity Bill 2012 are the subject of a separate inquiry by the Senate Standing Committee on Rural and Regional Affairs and Transport.[195] However, the Invasive Species Council noted that the biosecurity legislation does not address the post-border issues.[196]

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190 Hawke review, p. 185.

191 Hawke review, p. 185.

192 Hawke review, recommendation 23(1); see also Dr Carol Booth, Invasive Species Council, *Committee Hansard*, 22 February 2013, p. 8.

193 Australian Government, *Australian Government Response to the Report of the Independent Review of the Environment Protection and Biodiversity Conservation Act 1999*, August 2011, www.environment.gov.au/epbc/publications/pubs/epbc-review-govt-response.pdf (accessed 27 November 2012), p. 45.

194 Department of Agriculture, Fisheries and Forestry, Intergovernmental Agreement on Biosecurity, http://www.daff.gov.au/bsg/biosecurity-reform/activities-and-achievements2/intergovernmental-agreement-on-biosecurity-igab-and-national-environmental-biosecurity-response-agreement-nebra (accessed 5 April 2013).

195 See further Senate Standing Committee on Rural and Regional Affairs and Transport, http://www.aph.gov.au/Parliamentary_Business/Committees/Senate_Committees?url=rrat_ctte/Biosecurity_2012/index.htm (accessed 5 April 2013).

196 Invasive Species Council, *Submission 140*, p. 11.

Committee view

4.135 The committee acknowledges the evidence received in relation to key threats to Australia's threatened species and ecological communities, including habitat loss, degradation and fragmentation; invasive species; disease; climate change; and inappropriate fire regimes. The committee also recognises that the full impacts of the consequences of past practices, including historical land clearing and introduced invasive species, are still to be realised in many instances.

4.136 In terms of habitat loss, degradation and fragmentation, the committee acknowledges the evidence received that the introduction of legislation to regulate vegetation clearing in many state and territories may have made a big impact. The committee also notes that its recommendations in other chapters, relating for example, to critical habitat (see Chapter 5) and development assessment processes, including cumulative impacts and biodiversity offsets (see Chapter 7) also address the issues of habitat loss.

4.137 In relation to invasive species, the committee recognises the success of certain activities, including predator proof sanctuaries and baiting programs, as well as some threat abatement plans. The committee acknowledges the recent decision to list 'novel biota' as an overarching key threatening process, along with associated threat abatement guidelines. The committee hopes that this will prove to be a more strategic approach to improve management and control of invasive species, and will result in the development of an integrated planning framework to respond to invasive species.

4.138 The committee also recognises the success of many predator proof sanctuaries in helping to protect and recover threatened species. The committee considers that the department should give high priority to island sanctuaries – both mainland and offshore—when developing action plans and allocating funding.

Recommendation 14

4.139 The committee recommends that, in developing action plans, and allocating program funding, the Department of Sustainability, Environment, Water, Population and Communities consider greater use of predator exclusion fences and other forms of 'mainland island sanctuaries' for threatened species.

4.140 The committee particularly acknowledges the evidence of the importance of islands for many threatened species, and in particular, the need to prioritise biosecurity measures on island sanctuaries.

Recommendation 15

4.141 The committee recommends that the Department of Sustainability, Environment, Water, Population and Communities develop clear biosecurity strategies as part of action plans to protect island sanctuaries.

4.142 The committee also notes the evidence that environmental biosecurity needs to be given greater priority across the Australian mainland. In this context, the committee was convinced of the need to increase environmental biosecurity arrangements within Australian borders. The committee received evidence that use could be made of section 301A of the EPBC Act, to regulate the trade within Australia

of certain 'controlled' species, such as invasive plant species. This could be based on the Intergovernmental Agreement on Biosecurity, the Australian Weeds Strategy and the List of Weeds of National Significance. As recommended by the Hawke review, COAG should also be involved in this process, including developing criteria and management protocols for the movement of potentially damaging exotic species between states and territories, working towards a list of 'controlled' species for which cost-effective risk-mitigation measures may be implemented.[197]

Recommendation 16

4.143 The committee recommends that the Department of Sustainability, Environment, Water, Population and Communities develop regulations under section 301A of the *Environment Protection and Biodiversity Conservation Act 1999* for the regulation of controlled invasive plant species within Australia. The Council of Australian Governments should be involved in the process, to ensure that these measures are developed in consultation with state and territory governments.

4.144 The committee is concerned by evidence that there are limited control methods for some invasive species, such as feral cats. The committee acknowledges the evidence of the department in this regard, and commends the department for 'putting significant investment into the development of a broad scale toxic bait for feral cats'.[198] The committee commends the department for this work, and suggests specific research strategies be developed in conjunction with relevant research institutions, such as the CSIRO and the Invasive Animals Cooperative Research Centre, to develop biological controls for feral cats and other high impact invasive species.

Recommendation 17

4.145 The committee recommends that the Department of Sustainability, Environment, Water, Population and Communities develop specific research strategies in conjunction with relevant research institutions, such as the Commonwealth Scientific and Industrial Research Organisation and the Invasive Animals Cooperative Research Centre, to develop biological controls for feral cats and other high impact invasive species.

4.146 The committee is also persuaded by evidence that more research needs to be done in a range of areas relating to key threats – such the interaction of key threats; the impact of inappropriate fire regime on threatened species; and developing more effective control methods for invasive species such as biological control agents and sterilisation agents.

197 See Hawke review, recommendation 23.

198 SEWPAC, *Answers to questions on notice from public hearing*, 15 February 2013, p. 15 [Q 14].

Recommendation 18

4.147 The committee recommends that the Commonwealth government target more environmental research funding and programs towards effective control methods for invasive species.

4.148 The committee also acknowledges concerns raised in relation to the threat of disease to Australia's native species and the need for an improved approach to wildlife disease management. For this reason, the committee suggests that the TSSC consider listing wildlife disease as an overarching key threatening process in the same way it has listed 'novel biota'.

Recommendation 19

4.149 The committee recommends that the Threatened Species Scientific Committee considers listing 'wildlife disease' as an overarching key threatening process under the *Environment Protection and Biodiversity Conservation Act 1999*.

4.150 The committee recognises the need to consider and incorporate the potential impacts of climate change in all decision-making relating to threatened species and ecological communities. The committee also notes the evidence that climate change is likely to exacerbate the other threats to threatened species and ecological communities. In this context, the committee acknowledges SEWPAC's evidence that climate change is considered where relevant in recovery and threat abatement planning. The committee also notes that there are a number of other government initiatives which may help address this issue, such as the *National Wildlife Corridors Plan* (discussed elsewhere in this report).

4.151 In terms of the processes to address key threats to threatened species and ecological communities under the EPBC Act, the committee notes the evidence of the slow process for the listing of key threatening processes and development of threat abatement plans.

4.152 The committee welcomes the evidence from SEWPAC that is now developing 'threat abatement advices' at the time of listing key threatening processes. The committee considers that this may help address some of these concerns about the slow development of threat abatement plans, by providing some immediate guidance at the time of listing. The committee also notes SEWPAC's evidence that threat abatement advices 'can be updated as needed to reflect the most recent research outcomes and best practice in on-ground management'.[199]

4.153 The committee believes it is essential that both threat abatement plans and threat abatement advices are funded, implemented, monitored and reviewed as effectively as possible. At the same time, threat abatement plans also need to be deliverable and achievable, as is the case with recovery plans, and be developed with an appreciation of the potential resources available to support their implementation. As with recovery plans, it is also important to ensure that threat abatement plans

199 SEWPAC, *Submission 143*, p. 6.

contain achievable and measurable targets against which their effectiveness can be measured.

Recommendation 20

4.154 The committee recommends that all threat abatement plans contain realistic, measurable targets against which their effectiveness can be measured.

4.155 In this context, the committee is concerned by the evidence received about the lack of funding and implementation of some threat abatement plans. It was clear to the committee that adequate resources and funding are required, especially for the implementation of threat abatement plans and advices. This is discussed in further detail in Chapter 6, where the committee recommends that the Commonwealth government adjust existing funding programs, such as the Caring for our Country program and the Biodiversity Fund, to ensure that there is dedicated funding for threatened species and ecological communities, including for activities identified in threat abatement plans and advices.

4.156 The committee was also troubled by evidence that many threat abatement plans have not been reviewed, despite the requirement under subsection 279(2) of the EPBC Act that plans be reviewed at intervals of no longer than five years. The committee recommends that the department conduct a review of all threat abatement plans older than five years. The committee suggests that this review should include an evaluation of the extent to which actions identified in those plans have been implemented, and the success of those actions. The review should be completed within the next five years and at subsequent intervals of not more than five years. The reports on this evaluation should be made publicly available.

Recommendation 21

4.157 The committee recommends that the Department of Sustainability, Environment, Water, Population and Communities conduct a review of all threat abatement plans older than five years. This review should include an evaluation of the extent to which actions identified in those plans have been implemented, and the success of those actions. The review should be completed within the next five years and subsequent reviews should be undertaken at not less than five yearly intervals. The reports of these reviews should be made publicly available on the website of the Department of Sustainability, Environment, Water, Population and Communities.