Chapter 2

Koala population

2.1 It was widely recognised throughout this inquiry that Australia's koala population is in decline.[1] However the overall national picture is far from straightforward. There are remarkable regional differences across the koala's range, with overabundance in certain isolated island or localised populations, at the same time as serious documented declines in populations in certain rural, peri-urban and urban areas.

2.2 This chapter explores the following main issues:

- The importance of koala population data;
- Counting methodologies;
- Historical estimates of Australia's koala population;
- Current estimates of Australia's koala population;
- Population diversity; and
- Problems with current estimates.

2.3 The chapter concludes with the committee's views on the way forward on this important issue.

The importance of koala population data

2.4 The future conservation status and management of Australia's koalas is dependent upon accurate estimates of koala populations. The Conservation Council ACT Region submitted that:

> Lack of consensus regarding the size and viability of remaining populations and regarding the extent of and reasons for decline, or even overabundance in some instances, hinders the conservation task.[2]

2.5 A similar argument was made by the Wildlife Preservation Society of Queensland which submitted that:

> It is essential that koala populations are known because if you do not know what you are managing how do you know if your approach is appropriate.

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1 For example see: National Resource Management Ministerial Council, *National Koala Conservation and Management Strategy 2009–2014*, December 2009, p. 2; and Threatened Species Scientific Committee, *Advice to the Minister for Environment, Protection, Heritage and the Arts from the Threatened Species Scientific Committee (the Committee) on Amendment to the list of Threatened Species under the* Environment Protection and Biodiversity Conservation Act 1999 *(EPBC Act)*, September 2010, p. 20.

2 Conservation Council ACT Region, *Submission 61*, p. 2.

> Not only do you need to know the size, an understanding of the age classes is essential for effective conservation and appropriate management.[3]

2.6 Industry bodies also submitted that scientific estimates of the number of koalas are needed to provide the basis for government action:

> The Property Council believes that any decisions made on the future of the koala population must be based on this critical information.
>
> Too much regulation has already been implemented on the basis of anecdotal evidence.[4]

2.7 Native wildlife in Australia can be protected by legislation at both the Commonwealth and state level.[5] However, for a species to be given legislative protection, evidence of the rate of population decline is necessary.

2.8 In each of the state and territory jurisdictions where koala populations occur, legislation is in place to protect species that are vulnerable or threatened.[6] One way for species to be given protection under such legislation, is for environment ministers or independent scientific committees to be convinced that the species has undergone, or is likely to undergo, a demonstrable reduction in population size.[7]

2.9 At the Commonwealth level, accurate estimates of population size may assist a species to be 'listed' under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act).[8] According to the Commonwealth legislation, for a native species to be considered to be in the critically endangered, endangered, or vulnerable category it needs to meet one of five criteria. All of the criteria are dependent in one way or another on population data. For example several criteria require, amongst other things, data on the estimated total number of mature individuals or the rate of population decline.[9] The key EPBC Act conservation status criterion relevant to koalas (criterion one) requires not only current population data,

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3 Wildlife Preservation Society of Queensland, *Submission 15*, p. 4.

4 Property Council of Australia, *Submission 39*, p. 4.

5 For details see Chapter 5: The status of koalas under the law.

6 Threatened species are protected in New South Wales by the *Threatened Species Conservation Act 1995*, in Victoria by the *Flora and Fauna Guarantee Act 1988*, in Queensland by the *Nature Conservation Act 1992*, in South Australia by the *National Parks and Wildlife Act 1972* and in the Australian Capital Territory by the *Nature Conservation Act 1980*.

7 For example see New South Wales Office of Environment and Heritage, 'The listing process', 15 June 2011, www.environment.nsw.gov.au/threatenedspecies/listingts.htm (accessed 30 June 2011).

8 Under the EPBC Act the Threatened Species Scientific Committee advises the Environment Minister on which species to list as threatened. However ultimately it is the minister who decides which species should be listed. See Chapter 5: The status of koalas under the law.

9 Environment Biodiversity and Conservation Regulations 2000, section 7.01.

but also population data from three generations past, which according to the Threatened Species Scientific Committee (TSSC) is 20 years.[10]

2.10 In its letter to the minister on the listing of the koala under the EPBC Act, the TSSC emphasised the importance of robust population data:

> ...the koala population has undergone a marked decline over three generations, due to the combination of a range of actions. The [TSSC] therefore considers the koala to be potentially eligible for listing as vulnerable. However, better demographic data are needed to make this judgement with confidence.[11]

2.11 Further information about the deficiencies in koala population data is presented later in this chapter. The possible listing of the koala under the EPBC Act is further considered in Chapter 5: The status of koalas under the law.

2.12 Estimates of koala population numbers are also valuable in helping local governments to formulate and implement koala management policies.[12] For example Redland City Council submitted to the inquiry that estimates of low koala numbers and community concern prompted the council to develop and endorse a koala conservation and management policy.[13]

Counting methodologies

2.13 Due to their natural tendency for dwelling high in the tree tops, koalas are inherently difficult to find in the wild.[14] Koalas are not territorial and the home ranges

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10 Threatened Species Scientific Committee, answer to question on notice, 1 August 2011 (received 10 August 2011), p. 2, www.aph.gov.au/Senate/committee/ec_ctte/koalas/submissions.htm (accessed 30 August 2011). Criterion 1 of the *Guidelines for Assessing the Conservation Status of Native Species according to the* Environment Biodiversity and Conservation Act 1999 *(the EPBC Act) and* EPBC Regulations 2000, specifies the period to be 'over the last 10 years or three generations, whichever is longer', p. 3. See: www.environment.gov.au/biodiversity/threatened/pubs/guidelines-species.pdf (accessed 21 July 2011).

11 Threatened Species Scientific Committee (TSSC), 'Letter to the Minister for Sustainability, Environment, Water, Population and Communities regarding the conservation status of the koala', 30 September 2010, p. 1, www.environment.gov.au/biodiversity/threatened/species/pubs/koala-tssc-letter.pdf (accessed 27 June 2011).

12 For example see: Sunshine Coast Regional Council, *Submission 24*, p. 1; Port Stephens Comprehensive Koala Plan of Management Steering Committee, *Submission 38*, pp 1–5; Coffs Harbour City Council, *Submission 45*, p.1; and Redland City Council, *Submission 46*, p. 1.

13 Redland City Council, *Submission 46*, p. 1.

14 Koala Research Network, *Submission 29*, p. 2.

of individuals extensively overlap.[15] Koalas also tend to move little under most conditions, changing trees only a few times each day.[16] Therefore exact counts of koalas are usually conducted in relatively small and discrete localities. Estimates of koala numbers in larger areas are typically achieved by extrapolation using a number of different methodologies, some of which are outlined below.

Absolute counts

2.14 Small areas with defined boundaries can be examined systematically with line searchers to count all koalas. Each tree and shrub capable of supporting a koala is examined and marked so as not to double count animals.

2.15 According to Dr Alistair Melzer, the critical assumption of this methodology is that all animals are found and counted.[17] The search area must also be surveyed in one day to avoid complicating the count as animals move overnight. This limits the size of the area that can be searched.

Mark-resight

2.16 Koalas in a search area are caught and tagged with coloured ear tags before being released. After some period of time the habitat is surveyed and koalas are sighted with the number of tagged and untagged animals recorded. In its simplest form the proportion of re-sighted tagged animals to the total number of animals tagged is assumed to be the same as the proportion of all koalas sighted to the unknown total koala population, thus estimating the total population.[18]

2.17 Depending on the time between tagging and surveying, account needs to be taken of the death or emigration of tagged animals and the birth or immigration of new animals.[19] The method assumes that an even mixing of animals occurs across the extent of the habitat. In theory this method can be used to estimate populations across relatively large areas but is limited by resources, access and infrastructure.

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15 William Ellis, Alistair Melzer and Fred Bercovitch, 'Spatiotemporal dynamics of habitat used by koalas: The checkerboard model', *Behavioural Ecology and Sociobiology*, vol. 63, March 2009, p. 1181.

16 Threatened Species Scientific Committee, 'Advice to the Minister for Environment, Protection, Heritage and the Arts from the Threatened Species Scientific Committee on Amendment to the list of Threatened Species under the *Environment Protection and Biodiversity Conservation Act 1999*', p. 7, www.environment.gov.au/biodiversity/threatened/species/pubs/64971-listing-advice.pdf (accessed 28 June 2011).

17 Dr Alistair Melzer, *Submission 7*, p. 6.

18 Dr Alistair Melzer, *Submission 7*, pp 6–7.

19 Dr Alistair Melzer, *Submission 7*, p. 7.

Density from distance

2.18 Koalas are spotted during a systematic transect-based search of the target habitat. When a koala is sighted on or at a distance from the search route the perpendicular distance from the route to the koala is measured and recorded. The density of koalas is estimated from an analysis of the distances from the route to the koalas and the length of the route. It is assumed that animals above the transect will be detected and that detection declines with distance from the survey transect. The probability of detecting an animal with distance from the transect can be calculated.

2.19 According to Dr Melzer, koalas are suited to this survey method as they do not flee from the observer.[20] However skilled observers are required and a reasonable number of sightings is needed for meaningful estimations of density to be made. The method is suitable for surveying moderately large areas, though it is likely to be less useful or impractical in areas with low koala densities.[21]

Koala Habitat Atlas[22]

2.20 The Australian Koala Foundation (AKF) has sought to formulate a repeatable methodology for calculating estimates of koala population size and distribution across eastern Australia. By developing a repeatable methodology the AKF hopes to produce 'baseline figures with which future population estimates could be compared and monitored'.[23]

2.21 To this end the AKF has developed the Koala Habitat Atlas (KHA) for improving identification and ranking of koala habitat throughout New South Wales, Queensland and Victoria.[24]

2.22 The KHA mapping is based on the Native Vegetation Information System (NVIS). The NVIS is a comprehensive database that provides information on the extent and distribution of vegetation types across the Australian landscape down to one square kilometre. The NVIS Version 1 that is used in the KHA delineates 23 major vegetation groups around Australia. Five of the major vegetation groups include tree species used by koalas: Eucalypt tall open forests, Eucalypt open forests, Eucalypt woodlands, Eucalypt open woodlands and Callitris forests and woodlands.[25] These five vegetation groups are then classified as potential koala habitat.

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20 Dr Alistair Melzer, *Submission 7*, p. 7.

21 Dr Alistair Melzer, *Submission 7*, p. 7.

22 For further information on koala habitat see Chapter 3: Threats to koala habitat.

23 Australian Koala Foundation, *Submission 25*, Appendix 4, p. 3.

24 For an overview of the modelling process used to create the Koala Habitat Atlas see Australian Koala Foundation, *Submission 25*, Appendix 3: Revised koala status estimate June 2010, pp 1–16.

25 Australian Koala Foundation, *Submission 25*, Appendix 4, p. 4.

2.23 Using data on average koala home range size collected by the AKF or published in scientific papers, an estimate of koala abundance in potential koala habitat is achieved. This information is then used to create a population estimate.[26]

2.24 According to the AKF, their scientific staff and assistants have compiled a database of 80 000 individually measured trees from 2000 field sites across the natural range of the koala.[27] The AKF also submitted that their database which is made available to all researchers is unprecedented in size and is a resource that 'does not come close to existing in the Government'.[28]

2.25 The AKF stated that the both the NSW and Victorian governments have acknowledged the Koala Habitat Atlas.[29]

2.26 The AKF acknowledged the use of 'fairly broad-scale data' in developing the KHA, because 'in some places in the country there is very little data'.[30] Respected koala expert, Dr Melzer, who reviewed the methodology, supported the AKF's broad method, stating that 'I am firmly of the view that the general approach taken here [the AKF's koala population methodology] is the only way to assess potential koala habitat on a continental basis.'[31]

2.27 Whilst commending the work of the AKF in compiling the Koala Habitat Atlas, Dr Melzer submitted that the data need to be treated with caution:

> In general terms this [the Koala Habitat Atlas] is to identify discrete bioregional units, obtain available data on population density within the units and then extrapolate to the area of the mapped koala habitat within each unit. While there are many limitations to this approach *it remains the only effective approach to deriving such estimates*. However the results must be interpreted cautiously because the data behind the estimates is uncertain.[32]

2.28 It has been argued that the mapping achieved through the NVIS does not resolve riparian communities adequately and some acacia communities that have a

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26 Australian Koala Foundation, *Submission 25*, Appendix 4, p. 14.

27 Australian Koala Foundation, *Submission 25*, Appendix 3: Revised koala status estimate June 2010, p. 3.

28 Australian Koala Foundation, *Submission 25*, Appendix 3: Revised koala status estimate June 2010, p. 4.

29 Australian Koala Foundation, *Submission 25*, p. 6.

30 Ms Deborah Tabart, Australian Koala Foundation, *Committee Hansard*, 3 May 2011, p. 23.

31 Dr Alistair Melzer, quoted in Australian Koala Foundation, *Submission 25*, Appendix 6: Revised koala status estimate June 2010, p. 15.

32 Dr Alistair Melzer, *Submission 7*, p. 11. Italics in original. Associate Professor Clive McAlpine, Spokesperson, Koala Research Network also noted the uncertainties around the estimates: *Committee Hansard*, 3 May 2011, p. 3.

eucalypt component have been excluded.[33] According to Dr Melzer, 'as a result the approach will underestimate the extent of koala habitat – albeit expected to support low density populations'.[34]

2.29 Dr Melzer also submitted that the AKF's use of data from a range of published and unpublished sources that use different methodologies also present issues of comparability. The use of data sources from different time periods fails to take into account changes to population size since the data was published.[35]

2.30 In response to a question on notice, the TSSC described the KHA methodology as 'complex' but noted that this may be necessarily so:

> This is a complex approach, with many assumptions for each step, and where the consequences of inaccuracies or flawed assumptions may be magnified in subsequent steps of the calculations. Again, to be fair, any attempt at national population estimate for koalas may necessarily be complex and require a series of potentially flawed and compounding assumptions.[36]

2.31 The AKF acknowledged these sorts of criticisms, noting that:

> Whilst the methodology is open to criticism and will require ongoing refinement, the AKF holds that it draws credibility by incorporating the best available data from a wide range of sources. It provides a starting point for future monitoring programs and a sound basis for refining population estimates in collaboration with koala researches through the koala's remaining geographic range.[37]

Geo-plotting

2.32 The committee received evidence from Ms Carolyn Beaton, a former employee of the Australia Zoo Wildlife Hospital, who has created a website that uses geographic information system (GIS) software to capture data of koala sightings Australia-wide.[38] Once registered with the website 'Koala Diaries', members of the public are able to pinpoint the exact location of a koala sighting and then load this information onto a central database and map. Since the creation of the website in

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33 Dr Alistair Melzer, *Submission 7*, p. 11. A riparian community is a plant habitat that occurs on the banks of water courses.

34 Dr Alistair Melzer, *Submission 7*, p. 11.

35 Dr Alistair Melzer, *Submission 7*, p. 11.

36 Threatened Species Scientific Committee, answer to question on notice, 1 August 2011 (received 10 August 2011), p. 4. Further commentary by the TSSC about the AKF's population estimate is included below.

37 Australian Koala Foundation, *Submission 25*, Appendix 3: Revised koala status estimate June 2010, p. 15.

38 Ms Carolyn Beaton, *Submission 32*, p. 1.

February 2010, the website has recorded 2087 sightings mainly from South-East Queensland.[39]

2.33 This method of surveying koalas does not attempt to provide an estimate of the national koala population. Individual koalas may be counted and plotted several times under this methodology. However the aim of the website is to utilise 'community knowledge and grassroots efforts' to better understand koalas and their habitat in a single national database of koala sightings.[40]

Anecdotal evidence

2.34 Due to the difficulty, cost and logistics of conducting extensive counts of koala numbers across more than one million square kilometres of the koalas range, the committee received many anecdotal examples of the decline of regional koala populations.[41] The University of Queensland Koala Ecology Group stated that:

> Koala population estimates have, in the past relied generally on indirect methods of assessment, probably as a result of a lack of funding limiting more comprehensive investigations.[42]

2.35 Often community members who had resided in the same location for a number of years would quote a decline in hearing and seeing koalas. For example, the Port Stephen Comprehensive Koala Plan of Management Steering Committee submitted that:

> Anecdotally, many long term residents of Port Stephens LGA note that they would frequently see koalas on and around their properties 5–7 years ago and for the last two years koalas have rarely been sighted.[43]

2.36 The federal and state governments, research scientists, industry peak bodies and the Australian Koala Foundation have all recognised the need to move away from anecdotal estimates of koala populations.[44] The Koala Research Network put to the

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39 Ms Caroline Beaton, Co-founder and Administrator, Koala Diaries, *Proof Committee Hansard*, 3 May 2011, p. 37.

40 Ms Caroline Beaton, Co-founder and Administrator, Koala Diaries, *Proof Committee Hansard*, 3 May 2011, p. 37.

41 For example see: Mrs Vicki Green, *Submission 21*, p. 1; Mr Steve Morvell, *Submission 28*, p. 2; Mr Ian Pratt, *Submission 30*, p. 2; Port Stephens Comprehensive Koala Plan of Management Steering Committee, *Submission 38*, p. 4; Mr Ian Harling, *Submission 40*, p. 1; Ms Iris Bryce, *Submission 43*, p. 1; Mr Chris Degenhardt, *Submission 44*, p. 1; Name withheld, *Submission 59*, p. 4; and Mr Ian Bridge, *Submission 66*, p. 2.

42 University of Queensland Koala Ecology Group, *Submission 42*, p.2.

43 Port Stephens Comprehensive Koala Plan of Management Steering Committee, *Submission 38*, p. 2.

44 For example see: Australian Koala Foundation, *Submission 25*, p. 4; Koala Research Network, *Submission 29*, p. 2; Property Council of Australia, *Submission 39*, p. 4; University of Queensland Koala Ecology Group, *Submission 42*, p.2; and Department of Environment and Resource Management, Queensland Government, *Submission 79*, p. 5.

committee that 'it is becoming increasingly important to develop national standards and guidelines for assessing...koala populations'.[45]

Air-borne tracking

2.37 Developments in technology may allow for air-borne tracking of koala populations using infrared detectors. This technique may have benefits for assessing koala populations over large areas and in habitats where density is low.[46]

Community involvement

2.38 Many of the methods used for counting koalas and estimating population numbers require many hours of fieldwork. The committee received a number of submissions demonstrating the high degree of community interest and involvement in undertaking this work.[47] For example, Mr Chris Allen, who has a long history of involvement in koala conservation in NSW, submitted that:

> The level of voluntary involvement in agency-managed koala surveys in the [southern NSW] region, in which more than 300 volunteers have contributed to more than 800 days of fieldwork since 2007, is a testament to the local community's commitment to the koalas...Survey teams have searched for koala pellets through bush litter under more than 27 000 trees at more than 900 grid sites, enabling assessment of koala distribution and abundance over more than 35 000 ha of public and privately owned forests.[48]

Spot Assessment Technique – a habitat mapping methodology

2.39 In contrast to the various counting techniques listed above, the Spot Assessment Technique (SAT) was developed by the AKF in 1995 to determine preferred tree species for koalas and to measure koala activity at a particular site.[49]

2.40 The method involves assessing koala activity within the immediate area surrounding a preferred koala food tree. A tree with a breast height diameter of at least 100 millimetres is selected as the centre of the search plot. The 29 nearest trees with a similar minimum size are also included in the plot. A systematic search for koala

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45 Koala Research Network, *Submission 29*, p. 2.

46 Dr Alistair Melzer, *Submission 7*, p. 7.

47 For example see: Mr Robert Summers, *Submission 19*, p. 2; Mr Chris Allen, *Submission 35*, p. 5; Ms Deborah Tabart OAM, Chief Executive Officer, Australian Koala Foundation, *Proof Committee Hansard*, 5 May 2011, p. 21.

48 Mr Chris Allen, *Submission 35*, p. 5.

49 Stephen Phillips and John Callaghan, 'The Spot Assessment Technique: Determining the importance of habitat utilisation by koalas (*Phascolarctos cinereus*)', Australian Koala Foundation, Brisbane, p. 3.

faecal pellets within a one metre radius of each tree is then conducted. The search for faecal pellets continues for two minutes, or until evidence of koalas is found.[50]

2.41 The activity level for a SAT plot is expressed as a percentage equivalent of the number of surveyed trees that had evidence of koalas. For example, a sample of 30 trees of which 15 showed evidence of koalas, the resulting activity level would be determined as 50 per cent. Trees are then able to be ranked as either a primary or secondary koala tree species or a supplementary species.

2.42 According to the AKF, this method 'does not attempt to predict the abundance or density of local koala populations'.[51] Instead the SAT is:

> ...suitable for use in conjunction with land-use planning activities and/or policies that require Koalas and their habitat to be assessed, especially where identification of important areas for protection and management is required.[52]

2.43 The Port Stephens Comprehensive Koala Plan of Management Steering Committee criticised the SAT methodology as it indicates the presence of koalas in the past but gives no indication of more recent activity.[53] Koala scats are also difficult to age and are affected by rain and decomposition.[54]

2.44 Koala researchers at the University of Queensland also raised concerns about the SAT technique:

> Recent data confirm that reliance on scat presence to estimate tree species preference by koalas is not sufficient and in many cases inaccurate (Ellis et al. 1998; Matthews et al. 2007) and unfortunately this condemns some former research and predictions based on this principle. With the greater sophistication and the use of appropriate methods such as diet determination from faecal pellet analysis (Ellis et al. 1999), there is greater confidence in habitat predictions from recent studies.[55]

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50 For further information on the Spot Assessment Technique see: Stephen Phillips and John Callaghan, 'The Spot Assessment Technique: determining the importance of habitat utilisation by koalas (*Phascolarctos cinereus*)', Australian Koala Foundation, Brisbane.

51 Australian Koala Foundation, 'Koala Habitat Atlas', www.savethekoala.com/kha.html (accessed 30 June 2011).

52 Stephen Phillips and John Callaghan, 'The Spot Assessment Technique: determining the importance of habitat utilisation by koalas (*Phascolarctos cinereus*)', Australian Koala Foundation, Brisbane, p. 7.

53 Port Stephens Comprehensive Koala Plan of Management Steering Committee, *Submission 38*, p. 4.

54 Port Stephens Comprehensive Koala Plan of Management Steering Committee, *Submission 38*, p. 4.

55 University of Queensland Koala Ecology Group, *Submission 42*, p. 3.

2.45 The AKF submitted that whilst there has been some criticism of the SAT methodology in the literature:

> ...given the desire to develop a rapid and cost effective assessment methodology, and given that the results of SAT sampling generally reflect the scientific consensus with regards to important koala habitats, we feel that the SAT has merit.[56]

Preferred method

2.46 Many submitters stated that there is no best method for counting koala populations. According to the Koala Research Network, 'the selection of the method depends upon the questions being asked'.[57]

2.47 In a similar vein, the University of Queensland Koala Ecology Group advised the committee that a combination of a number of methods is sometimes the most accurate way of determining koala activity and populations size:

> The indirect methods of estimating koala demographics – e.g. using scat presence – are limited and unreliable, but they still provide unequivocal evidence of koala presence. Newer survey methods that combine scats, signs, sounds, visual confirmation (e.g. density from distance, airborne heat detection) are being applied in a few long term reference sites across the range of the koala.[58]

Historical estimates of Australia's koala population

2.48 It is estimated that the koala population prior to European settlement was in the order of up to 10 million koalas.[59]

2.49 Not long after European settlement, koala numbers experienced a 'severe decline'. According to the *National Koala Conservation and Management Strategy 2009–2014*:

> ...clearing of habitat for agriculture in combination with hunting, disease, fire and drought resulted in a severe population decline. By the late 1930s they were considered extinct in South Australia and severe declines had occurred in New South Wales, Victoria and Queensland. However, in the

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56 Australian Koala Foundation, *Submission 25*, Appendix 4: Koala Population Estimates Explanation of Methodology & Recommendations to the Threatened Species Scientific Committee (TSSC) Threatened Species Assessment of Phascolarctos cinereus (Koala), 2010, p. 7.

57 Koala Research Network, *Submission 29*, p. 2.

58 University of Queensland Koala Ecology Group, *Submission 42*, p. 3.

59 See: Australian Koala Foundation, *Submission 25*, p. 3; and Bill Phillips, *Koalas: The little Australians we'd all hate to lose*, Australian Government Publishing Service, Canberra, 1990, pp 20–26.

> late 1930s the fur trade ceased and state governments were introducing protective measures...[60]

2.50 In his book *Koalas: The little Australians we'd all hate to lose*, author Bill Phillips provides a detailed picture of the reasons for the decline in the koala population following European settlement. Phillips states that '...during the late nineteenth and early twentieth centuries the fur trade was responsible for the death of several million koalas'.[61] The poisoning and wire snaring of koalas devastated populations in South Australia and Victoria and numbers in New South Wales were declining.[62]

2.51 Open hunting seasons on the koala were declared in Queensland in 1915, 1917 and 1919. Between 1 April and 30 September 1919 it was estimated that one million koala skins were gathered.[63] The last open season on koalas occurred in Queensland in 1927 with approximately 584 000 koalas killed.[64]

2.52 According to Phillips, by the 1930s the state of the koala population had been severely depleted such that:

> ...koalas were considered extinct in South Australia. There were apparently only hundreds in New South Wales, thousands in Victoria, and but ten thousand left in Queensland. While the accuracy of these estimates is uncertain, they give an indication of the extent to which koalas were decimated by the fur trade, disease and the clearing of forests for grazing and cultivation.[65]

2.53 By the late 1930s the fur trade had ceased and state governments had introduced legislation to provide limited protection to koalas. The first state to introduce protective measures for koalas was Victoria in 1898. New South Wales

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60 National Resource Management Ministerial Council, *National Koala Conservation and Management Strategy 2009–2014*, December 2009, p. 12.

61 Bill Phillips, *Koalas: The little Australians we'd all hate to lose*, Australian Government Publishing Service, Canberra, 1990, p. 25.

62 According to Phillips, the poisoning and snaring of koalas was the method preferred by hunters for collecting koala pelts as shooting koalas would damage their fur. See Bill Phillips, *Koalas: The little Australians we'd all hate to lose*, Australian Government Publishing Service, Canberra, 1990, p. 21.

63 Bill Phillips, *Koalas: The little Australians we'd all hate to lose*, Australian Government Publishing Service, Canberra, 1990, p. 22.

64 Bill Phillips, *Koalas: The little Australians we'd all hate to lose*, Australian Government Publishing Service, Canberra, 1990, p. 22.

65 Bill Phillips, *Koalas: The little Australians we'd all hate to lose*, Australian Government Publishing Service, Canberra, 1990, p. 26.

followed suit in 1903 with the Native Animals Protection Act. In South Australia koalas became protected under the Animals Protection Act of 1912.[66]

2.54 Translocation programs were also used to re-establish koala colonies in their former range. Animals from French Island and Phillip Island were used to reintroduce populations to mainland Victoria and to a lesser extent South Australia and the Australian Capital Territory.[67] In South Australia, populations were also introduced at various stages during the twentieth century to regions outside their original distribution: Kangaroo Island in the 1920s, Adelaide Hills in the 1930s to 1970s and the Eyre Peninsula in 1969.[68]

Historical variations

2.55 According to Dr Alistair Melzer, the uneven distribution of the national koala population probably predates European settlement of the Australian landscape and likely 'reflects the variability in plant communities and associated nutrient and moisture regimes'.[69] Historically, the koala has also been known to go through fluctuations in its population. The TSSC gave the specific example of the Federation drought:

> The koala recovered from the "Federation" drought across central Queensland with sufficient speed and extent to be the subject of intensive hunting and harvesting programs within 20–30 years of the drought's cessation. In that region, the Federation drought was at least comparable – if not more extreme – than the most recent drought...
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> In addition, there was substantial land clearance (by extensive ring-barking), hunting and poisoning immediately prior to and following the Federation drought. It is therefore reasonable to assume that the koala has evolved to cope with considerable climatic fluctuation, and should recover from this most recent drought.[70]

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66 Bill Phillips, *Koalas: The little Australians we'd all hate to lose*, Australian Government Publishing Service, Canberra, 1990, p. 22.

67 Natural Resource Management Ministerial Council, *National Koala Conservation and Management Strategy 2009–2014*, Department of Environment, Heritage and the Arts, Canberra, 2009, p. 12, www.environment.gov.au/biodiversity/publications/koala-strategy/pubs/koala-strategy.pdf (accessed 30 June 2011).

68 Natural Resource Management Ministerial Council, *National Koala Conservation and Management Strategy 2009–2014*, Department of Environment, Heritage and the Arts, Canberra, 2009, p. 12.

69 Dr Alistair Melzer, *Submission 7*, p. 5.

70 Threatened Species Scientific Committee, answer to question on notice, 1 August 2011 (received 10 August 2011), p. 9. The footnotes that appear in the original quote have not been reproduced.

2.56 However, Dr John Woinarski, who appeared before the committee as a member of the TSSC, qualified the comparison between the Federation drought and the most recent one, saying:

> All such climatic fluctuations are different. Immediately following the Federation drought there was a series of hunting episodes and episodes of clearing in Queensland as well. It is likely that the cocktail of factors this time around [increasing human population, land clearance, dog numbers] may be more damaging, yes.[71]

2.57 A number of koala specialists, Professor Frank Carrick, Dr Alistair Melzer, Dr Bill Ellis and Dr Sean Fitzgibbon, disputed the TSSC's characterisation of the fluctuation of the koala population:

> Whilst we concur [with the TSSC's evidence that] "Assessment of the koala is neither straightforward nor simple", the assertion that "historically, koala populations have shown very substantial fluctuations" neglects the context that most of the observed "fluctuations" have been population crashes associated with anthropogenically driven factors such as profligate hunting and major disease epizootics [a disease that rapidly affects many animals in a specific area at the same time] following hard on the heels of major habitat destruction episodes...[72]

Early population surveys

2.58 The first national survey of the koala population was conducted from 1986 to 1987 by the National Parks and Wildlife Service. The *National Koala Survey* did not set out to estimate the total number of koalas in the wild. Rather it was designed to pin point locations where koalas warranted special attention and to make an informed assessment of the conservation status of the species on a national basis. The survey also collected information on the preferred tree species of koalas, the dominant land use surrounding koala habitat and the prevalence of disease in koalas.[73]

2.59 The *National Koala Survey* identified a total of 3145 sites where koalas were either observed or thought to be present from tell-tale signs.[74] The survey found that in the southern states, koalas had recovered from being extinct in South Australia and near-extinct in Victoria to have flourishing populations. The survey noted that the

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71 Dr John Woinarski, Member, Threatened Species Scientific Committee, *Committee Hansard*, 1 August 2011, p. 47.

72 Professor Frank Carrick, Dr Alistair Melzer, Dr Bill Ellis and Dr Sean Fitzgibbon, *Submission 101*, p. 6.

73 For further information on the National Koala Survey see Bill Phillips, *Koalas: The little Australians we'd all hate to lose*, Australian Government Publishing Service, Canberra, 1990, pp 31–50.

74 Bill Phillips, *Koalas: The little Australians we'd all hate to lose*, Australian Government Publishing Service, Canberra, 1990, p. 49.

Kangaroo Island and French Island populations had to be reduced through translocations and that 'the future of koalas in southern Australia should be assured'.[75]

2.60 The survey identified that at the northern end of their range, koalas are most abundant in the north-east corner of New South Wales and the south-east corner of Queensland. The survey further noted that:

> Both areas have rapidly expanding urban centres likely to threaten habitat occupied by koalas. Unless land management practices takes account of the habitat needs of koalas then local extinctions are inevitable.[76]

2.61 However for the species to survive in the long-term, the *National Koala Survey* believed that the ability of koalas to repopulate in southern Australia was evidence that koala populations 'can be managed, if necessary, to augment dwindling populations or to recolonise areas which once supported koalas'.[77]

Current estimates of Australia's koala population

National estimates

2.62 More recently, and despite the cessation of the koala fur trade, Australia's koala population has 'undergone marked decline over three generations'.[78] These marked population declines are due to '...extensive habitat clearing and fragmentation...disease, fire, drought and, more recently road deaths and predation by dogs'.[79]

2.63 However despite widespread recognition of this worsening trend, the 'national population of the koala remains unclear...'[80] According to their most recent advice to the Commonwealth environment minister in 2010, the Threatened Species Scientific Committee stated that:

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75 Bill Phillips, *Koalas: The little Australians we'd all hate to lose*, Australian Government Publishing Service, Canberra, 1990, p. 49.

76 Bill Phillips, *Koalas: The little Australians we'd all hate to lose*, Australian Government Publishing Service, Canberra, 1990, p. 49.

77 Bill Phillips, *Koalas: The little Australians we'd all hate to lose*, Australian Government Publishing Service, Canberra, 1990, p. 49.

78 Threatened Species Scientific Committee, letter to Minister for Sustainability, Environment, Water, Population and Communities, September 2010, Department of Sustainability, Environment, Water, Population and Communities, *Submission 73, Attachment C*, p. 1.

79 National Resource Management Ministerial Council, *National Koala Conservation and Management Strategy 2009–2014*, December 2009, p. 2.

80 National Resource Management Ministerial Council, *National Koala Conservation and Management Strategy 2009–2014*, December 2009, p. 18.

> There is at present no published scientifically peer-reviewed estimate of the total number of koalas in Australia and no definitive past estimate within an appropriate timeframe to enable comparison.[81]

2.64 The *National Koala Conservation and Management Strategy 2009–2014* notes that 'deriving reliable broad-scale koala population estimates remains very difficult, so the national population of the koala remains unclear at this stage'.[82] The strategy notes that:

> At a national level, it may be more realistic to estimate the extent of habitat loss, fragmentation and modification and declines in distribution as indicators of koala population declines rather than population *per se*.[83]

2.65 Whilst the overall size of the national population appears to be uncertain, it was widely stated by the majority of submitters that a significant number of local and regional koala populations are declining.[84] Drought, climatic extremes, loss of critical habitat, urbanisation and disease were the main reasons quoted for the decline of koala numbers.[85]

2.66 Estimates of koala numbers have been gathered at specific locations rather than across the nation as a whole and have used a variety of different counting methods. Professor McAlpine, spokesperson for the Koala Research Network, explained to the committee:

> We do not know confidently the number of the overall koala population in Australia. There are estimates of regional populations which we know reasonably well, such as in parts of south-east Queensland and in western Queensland, but overall I do not think we can confidently say what the numbers are.[86]

2.67 Dr Bill Ellis explained to the committee the funding constraints faced by researchers in estimating koala numbers:

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81 Threatened Species Scientific Committee, *Advice to the Minister for Environment, Protection, Heritage and the Arts from the Threatened Species Scientific Committee (the Committee) on Amendment to the list of Threatened Species under the* Environment Protection and Biodiversity Conservation Act 1999 *(EPBC Act)*, September 2010, p. 20.

82 Natural Resource Management Ministerial Council, *National Koala Conservation and Management Strategy 2009–2014*, Department of Environment, Heritage and the Arts, Canberra, 2009, p. 18.

83 Natural Resource Management Ministerial Council, *National Koala Conservation and Management Strategy 2009–2014*, Department of Environment, Heritage and the Arts, Canberra, 2009, p. 18.

84 For example see: Koala Research Network, *Submission 29*, p. 2.

85 For further information on drought and climatic extremes see Chapter 3: Threats to koala habitat.

86 Associate Professor Clive McAlpine, Spokesperson, Koala Research Network, *Committee Hansard*, 3 May 2011, p. 3.

> The issue for us there is that we do not have the resources to go out and count all of the koalas to get that sort of a number. All of our studies are focused on particular areas...[87]

2.68 The most widely quoted estimate of the national koala population comes from the AKF which estimates that there are between 43 515 and 84 615 koalas left in the wild.[88] This range was broadly supported by Professor McAlpine, Spokesperson, Koala Research Network, who stated:

> There were once millions of koalas in Australia; now there are probably no more than somewhere between 50,000 and 100,000, but we cannot confidently say what those numbers are.[89]

2.69 As noted above, koala experts such as Dr Melzer submitted that the AKF figure must be 'interpreted cautiously because the data behind the estimates is uncertain.'[90]

2.70 While recognising and welcoming 'the attempt by the AKF to provide a national, systematic and integrated approach to koala distributional modelling, habitat preference and population assessment' the TSSC critiqued the AKF's estimate saying that it was not based on peer reviewed science. Other concerns raised by the TSSC were that the AKF's population estimate excludes all koalas living is South Australia and, as discussed above, the methodology used to arrive at the overall estimate.[91]

2.71 The AKF disputed the TSSC's claim that it did not rely on peer reviewed science, submitting that:

> In designing the methodological steps outlined below, AKF has drawn on the collective research funded and managed by the AKF under the auspices of many eminent koala scientists...in Australia.[92]

2.72 The Commonwealth government does not have a definite estimate of the national koala population as an alternative to the AKF's estimate.[93] In its advice to the Environment Minister the TSSC estimated the koala population is 'greater than 200 000 individuals, with large populations in a number of locations over four

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87 Dr Bill Ellis, Koala Specialist, Koala Research Network, *Committee Hansard*, 3 May 2011, p. 4.

88 Australian Koala Foundation, *Submission 25*, p. 4.

89 Associate Professor Clive McAlpine, Spokesperson, Koala Research Network, *Committee Hansard*, 3 May 2011, p. 3.

90 Dr Alistair Melzer, *Submission 7*, p. 11.

91 Threatened Species Scientific Committee, answer to question on notice, 1 August 2011 (received 10 August 2011), pp 4–5.

92 Australian Koala Foundation, *Submission 25*, p. 4.

93 Australian Koala Foundation, *Submission 25*, p. 3. Appendix 2 of the AKF submission provides a list of koala research funded by the foundation.

states.'[94] However, other than some sporadic information about individual regional or state populations, the TSSC provided the environment minister with very little other information about the national koala population.

2.73 During the inquiry the committee sought further information from the TSSC on this important issue. In response to questions on notice, the TSSC indicated that:

> Based on information presented at our commissioned workshop, and published and unpublished information, we estimated the koala abundance across all regions within their range, at the time of assessment and about 20 years previously. We concluded that the national koala population in 1990 was about 430,000, and in 2010 was about 300,000, a decline of about 31%. Based on more recent information made available since our assessment, we estimate that a plausible lower bound for the current national koala population is about 200,000 individuals. If regions in which the recent koala decline has been driven primarily by drought are excluded from consideration, we estimate that the decline over the rest of the range between 1990 and 2010 is about 16%.[95]

2.74 Several state governments have prepared state-wide population estimates which are mentioned below.

2.75 The problems with current estimates of koala population numbers are discussed in later in this chapter.

Queensland

2.76 The Threatened Species Scientific Committee noted that the current koala population estimate in Queensland is 'problematic because of the koala's wide distribution to the north and west, and the lack of quantitative data in those regions'. The TSSC judged that 'a reasonable estimate baseline (i.e. three generations ago) figure for Queensland is approximately 300 000 koalas with a plausible range of 180 000 to 550 000.'[96] The TSSC did not provide a comparable figure for the current Queensland koala population.

2.77 Since 1994 the Queensland state government has solely or jointly funded research into estimating koala populations in the south-east of the state. Surveys of

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94 Threatened Species Scientific Committee, *Advice to the Minister for Environment, Protection, Heritage and the Arts from the Threatened Species Scientific Committee (the Committee) on Amendment to the list of Threatened Species under the* Environment Protection and Biodiversity Conservation Act 1999 *(EPBC Act)*, September 2010, p. 28.

95 Threatened Species Scientific Committee, answer to question on notice, 1 August 2011 (received 10 August 2011), p. 2.

96 Threatened Species Scientific Committee, *Advice to the Minister for Environment, Protection, Heritage and the Arts from the Threatened Species Scientific Committee (the Committee) on Amendment to the list of Threatened Species under the* Environment Protection and Biodiversity Conservation Act 1999 *(EPBC Act)*, September 2010, p. 25.

koala populations have concentrated on the 'Koala Coast'[97] and Pine Rivers areas. Data are not available for other significant populations in the state, although the government believes that:

> ...in areas where land use is undergoing similar changes to those occurring in the south-east, it is expected that koala population dynamics will reflect those of the Koala Coast and Pine Rivers.[98]

2.78 The survey method used by the Queensland government includes habitat stratification and intensive, systematic daytime searches of strip transect. Geographic information system and remote sensing methodologies are also used to assess the koala habitat component of the regional koala abundance estimates. According to the government:

> This approach allows for the identification and determination of habitat areas for conservation based on where koalas actually occur rather than identifying distributions of 'preferred' tree species or community reports.[99]

2.79 The 2008 Queensland government survey of the Koala Coast koala population estimated a 51 per cent decline in just three years and a 64 per cent decline in ten years. Koala numbers have dropped from an estimate of 4611 koalas in 2005–2006 to just 2279 in 2008.[100] An earlier survey in 1996–1999 estimated that there were 6246 koalas.[101]

2.80 A mapping and surveying project found that koala densities in the Pine Rivers area had declined by 45 per cent in urban areas and by 15 per cent in bushland sites.[102]

2.81 The Queensland government has committed $2.5 million in funding over five years to expand the surveying and monitoring of koala populations across the south-east Queensland region.[103] Monitoring of koala populations will also commence at Ipswich and Oakey.

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97 The Koala Coast encompasses most of the local government area of Redland City Council, along with parts of Brisbane City Council and Logan City Council.

98 Department of Environment and Resource Management, Queensland Government, *Submission 79*, p. 3.

99 Department of Environment and Resource Management, Queensland Government, *Submission 79*, p. 7.

100 Department of Environment and Resource Management, Queensland Government, *Submission 79*, p. 6.

101 Department of Environment and Resource Management, Queensland Government, *Submission 79*, p. 6. See also Redland City Council, *Submission 46*, p. 1.

102 Department of Environment and Resource Management, Queensland Government, *Submission 79*, p. 6.

103 Department of Environment and Resource Management, Queensland Government, *Submission 79*, p. 6.

2.82 The Threatened Species Scientific Committee made the following assessment of the broader coastal south east Queensland region:

> Koala populations in all SEQ coastal local government areas (Sunshine Coast; Moreton Bay; Brisbane; Redland; Logan; and Ipswich) appear to be following a similar downward trend to the Koala Coast and Pine Rivers populations, as evidenced by a rapid increase in the numbers of sick, injured and dead koalas, followed by a decline in koala numbers. Further north, koala populations are less well known, often becoming known as a result of development applications, but are generally considered to be at low density (<0.2 koalas/ha) (White et al. 2005; Queensland EPA 2006).[104]

2.83 In other parts of the state, Dr Gregory Baxter of the Koala Research Network informed the committee of an 80 per cent population decline in the western mulga regions of Queensland:

> ...where we do have good estimates, like in the mulga lands in western Queensland, we found that there was probably about 60,000 koalas there in the mid-90s. We have just gone back and done the methodology in the same way and there are probably only about 11,000 or 12,000 there now in the same place. So everywhere we do have good data we find the same trend—it is going down—so there is no reason to expect that in places where we do not have the data there is something different going on. I think it is probably uniform across the country.[105]

2.84 The committee also heard evidence from Dr Bill Ellis of a koala population in Springsure where current surveys indicate that koala numbers have declined by 95 per cent as compared to figures from the 1970s.[106]

New South Wales

2.85 Koalas were formerly widespread in New South Wales. According to the former NSW Department of Environment, Climate Change and Water, remaining populations are now concentrated on the central, mid-north and north coasts, and in the north-west part of the state.[107] Small and isolated populations also occur on the south and far south coasts, and on the table lands of the Great Dividing Range.

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104 Threatened Species Scientific Committee, *Advice to the Minister for Environment, Protection, Heritage and the Arts from the Threatened Species Scientific Committee (the Committee) on Amendment to the list of Threatened Species under the* Environment Protection and Biodiversity Conservation Act 1999 *(EPBC Act)*, September 2010, p. 25.

105 Dr Gregory Baxter, Koala Research Network, *Committee Hansard*, 3 May 2011, p. 3.

106 Dr William Ellis, Koala Specialist, Koala Research Network, *Committee Hansard*, 3 May 2011, p. 4.

107 New South Wales Department of Environment, Climate Change and Water, *Submission 78*, p. 1. In April 2011, most of the functions of the Department of Environment, Climate Change and Water were transferred to the Office of Environment and Heritage within the NSW Premier's department.

2.86 Submitters such as Professor Carrick drew the committee's attention to a series of documented local extinctions in NSW.[108] The *NSW Recovery Plan for the Koala* also states that 'surveys in New South Wales indicate that since 1949, populations of koalas have been lost from many localities, particularly on the southern and western edges of their distribution'.[109]

2.87 According to the *NSW Recovery Plan for the Koala*, 'there have been no studies to estimate the size of the NSW koala population'.[110] The population estimates that do exist for the state are described as being 'reasonable guesses and each can be justified'.[111]

2.88 It has been speculated that the koala population in New South Wales could be between 1000 and 10 000 individuals however this figure is disputed.[112] The TSSC told the committee that their estimates for the koala population in the state was 'at least 30 000 on public land'.[113] The TSSC however did not reveal how they arrived at this figure.

2.89 The *NSW Recovery Plan for the Koala* recognises the value of estimating the population size in NSW, however of a higher priority to the New South Wales government is assessing changes in distribution and not numbers.[114]

Australian Capital Territory

2.90 The committee did not receive any specific evidence on the state of the koala population in the ACT. According to the Threatened Species Scientific Committee, the koala population of the ACT is likely to be very small.[115] There have been at least

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108 Professor Frank Carrick, *Submission* 86, p. 26. See also Dr Jon Hanger, *Committee Hansard*, 3 May 2011, p. 15.

109 Department of Environment and Climate Change NSW, *NSW Recovery Plan for the Koala*, Department of Environment and Climate Change NSW, November 2008, p. 1.

110 Department of Environment and Climate Change NSW, *NSW Recovery Plan for the Koala*, Department of Environment and Climate Change NSW, November 2008, p. 10.

111 Department of Environment and Climate Change NSW, *NSW Recovery Plan for the Koala*, Department of Environment and Climate Change NSW, November 2008, p. 11.

112 Department of Environment and Climate Change NSW, *NSW Recovery Plan for the Koala*, Department of Environment and Climate Change NSW, November 2008, p. 11.

113 Dr John Woinarski, Member, Threatened Species Scientific Committee, *Proof Committee Hansard*, 1 August 2011, p. 50.

114 Department of Environment and Climate Change NSW, *NSW Recovery Plan for the Koala*, Department of Environment and Climate Change NSW, November 2008, p. 11.

115 Threatened Species Scientific Committee, *Advice to the Minister for Environment, Protection, Heritage and the Arts from the Threatened Species Scientific Committee (the Committee) on Amendment to the list of Threatened Species under the* Environment Protection and Biodiversity Conservation Act 1999 *(EPBC Act)*, September 2010, p. 25.

six introductions from Victoria but no large or dense populations have ever become established.

Victoria

2.91 According to the Victorian government, there is currently no accurate estimate for the koala population in the state because the species is 'so widespread, is difficult to accurately census, and occurs at widely variant population densities'.[116]

2.92 The TSSC estimated that there are approximately 73 500 koalas in Victoria and this population is largely 'a function of the translocation program that has been operating for several decades.'[117]

2.93 In its submission the Victorian government noted the TSSC's estimate of the state population. The government however stated that monitoring sites in Victoria currently represent less than 1 per cent of the total koala habitat in the state and that the TSSC figure:

> ...should not be taken out of context, as it was not meant to be an estimate of the total number of Koalas in Victoria. Furthermore, it is important to note that this estimate is certainly an under-estimate because Koala populations occur in many areas away from those for which population estimates were provided and many of these estimates were highly conservative.[118]

2.94 The Victorian government also submitted that at sites where koala populations are overabundant, animals are being treated with contraception to limit their numbers:

> High-density, but small (<3000 individuals) populations on French Island, Raymond Island and at Tower Hill State Game Reserve are now being controlled by very intensive and expensive programs of mass contraception using modified human contraception implants adapted for the Koala...[119]

2.95 Despite the overabundance of koalas in certain parts of Victoria (such as French Island, Raymond Island, the Otway Ranges and Mt Eccles), the government recognised that koalas are not 'flourishing everywhere in Victoria'.[120]

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116 State of Victoria, *Submission 97*, p. 2.

117 Threatened Species Scientific Committee, *Advice to the Minister for Environment, Protection, Heritage and the Arts from the Threatened Species Scientific Committee (the Committee) on Amendment to the list of Threatened Species under the* Environment Protection and Biodiversity Conservation Act 1999 *(EPBC Act)*, September 2010, p. 21.

118 State of Victoria, *Submission 97*, p. 2.

119 State of Victoria, *Submission 97*, p. 2.

120 State of Victoria, *Submission 97*, p. 2.

2.96 Koala populations with less than one animal per hectare exist across central Victoria, the Strathbogie Plateau, the lower Glenelg River region, the Bendigo-Ballarat region and in south Gippsland.[121]

2.97 The committee also received evidence of the rapidly declining koala populations on the once over-populated Phillip Island. Phillip Island Nature Parks submitted to the committee that the koala population on Phillip Island has declined dramatically over the past three decades from 847 koalas in 1973 to 13 koalas in 2006.[122]

2.98 The committee also heard that a genetically diverse and significant koala population resides in the Strzelecki Ranges:

> The Strzelecki koala population has high levels of genetic variability which have been detected by rare and unique genetic markers. These animals are statistically differentiated from other Australian populations and therefore constitute a separate management unit.[123]

2.99 No population surveys have been conducted on the Strzelecki population.[124]

South Australia

2.100 In South Australia, the natural range of the koala is restricted to the south-east of the state. After being presumed extinct in the state in the 1920s, the koala population was reintroduced to its natural range with animals from Victoria.[125] Koalas were also translocated to areas outside of their natural range, namely to: Kangaroo Island, Lower Eyre Peninsula, Adelaide's Mount Lofty Ranges and the Riverland regions. Today in some areas they are increasing in number and overabundant in other areas.[126] For example the TSSC stated that the density of the koala population on

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121 Mr Peter Menkhorst, Department of Sustainability and Environment, *Proof Committee Hansard*, 1 August 2011, p. 30.

122 Phillip Island Nature Parks, *Submission 80*, p. 2.

123 Friends of the Earth Melbourne, *Submission 50*, p. 6.

124 Mr Anthony Amis, Land Use Researcher, Friends of the Earth, *Proof Committee Hansard*, 1 August 2011, p. 9. More information on the Strzelecki koalas is included in chapter 3.

125 Threatened Species Scientific Committee, *Advice to the Minister for Environment, Protection, Heritage and the Arts from the Threatened Species Scientific Committee (the Committee) on Amendment to the list of Threatened Species under the* Environment Protection and Biodiversity Conservation Act 1999 *(EPBC Act)*, September 2010, p. 4.

126 Department of Environment and Natural Resources, Government of South Australia, *Submission 77*, p. 1.

Kangaroo Island is putting 'unsustainable browsing pressure' on preferred tree species.[127]

2.101 Koalas in South Australia are genetically very closely related – generally descended from the very small numbers that were introduced onto Kangaroo Island.[128]

2.102 The koala population on Kangaroo Island increased dramatically between the 1920s and the 1990s. In 1997 the South Australian environment department commenced a program to reduce the population on Kangaroo Island to sustainable levels through surgical sterilisation and translocation.[129] According to the government this was necessary because the highly selective browsing of koalas represented a significant threat to Kangaroo Island's unique vegetation, in particular the Manna Gum.[130] Consistent with the *National Koala Conservation and Management Strategy 2009–2014*, the South Australian government has not considered culling as an appropriate management option for koalas.[131]

2.103 In 2001 an island wide survey estimated a population of 27 000 koalas on Kangaroo Island.[132] This survey was repeated in 2006 with a revised population of 16 000 koalas. The latest island wide survey took place in 2010 and preliminary results indicate that the population continues to decrease.[133]

2.104 According to the South Australian government, the poor genetic quality of koalas in South Australia and their overabundance has meant that:

> Management is generally directed towards the maintenance of the existing populations for their contribution to national rather than State goals.[134]

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127 Threatened Species Scientific Committee, *Advice to the Minister for Environment, Protection, Heritage and the Arts from the Threatened Species Scientific Committee (the Committee) on Amendment to the list of Threatened Species under the* Environment Protection and Biodiversity Conservation Act 1999 *(EPBC Act)*, September 2010, p. 4.

128 Department of Environment and Natural Resources, Government of South Australia, *Submission 77*, pp 1–2.

129 Department of Environment and Natural Resources, Government of South Australia, *Submission 77*, p. 2.

130 Department of Environment and Natural Resources, Government of South Australia, *Submission 77*, p. 2.

131 Department of Environment and Natural Resources, Government of South Australia, *Submission 77*, p. 2.

132 Department of Environment and Natural Resources, Government of South Australia, *Submission 77*, p. 2.

133 Department of Environment and Natural Resources, Government of South Australia, *Submission 77*, p. 2.

134 Department of Environment and Natural Resources, Government of South Australia, *Submission 77*, p. 2.

Population diversity

2.105 A recurring theme throughout this inquiry was the varying levels of genetic diversity of koalas from different regions. With a few notable exceptions, for example the Strzelecki koala in Victoria's Gippsland region, there was a general recognition of a north-south divide – with north koalas possessing greater genetic diversity than their southern cousins.

2.106 Whilst the koala populations in Victoria and South Australia are more numerous than those in New South Wales and Queensland, they are not genetically diverse.[135] This is the result of the large reintroduced populations of koalas in the southern states originating from only a very few individuals.[136] The TSSC described 'the majority of Victorian koalas, and all South Australian koalas' as representing 'little genetic capital.'[137] The TSSC observed that the low genetic variability of koalas in these areas also 'reduces the population's ability to adapt to change, which may exacerbate the effects of disease, over-browsing or climate change.'[138]

2.107 Whilst recognising the potential threat posed by low genetic diversity, the TSSC indicated that 'other than isolated reports of individual deformities that may or may not be due to inbreeding, there is no evidence at present that population growth is being impacted by low genetic diversity.' Indeed, the TSSC noted the somewhat counterintuitive fact that 'these [southern] populations are mostly showing far greater levels of population increase than is the case for the more genetically variable populations in parts of Queensland and New South Wales.'[139]

2.108 The TSSC went on to explain that:

> ...we do not know what impact there may have been on the functional variation that will determine how a population responds to new environmental challenges. To be able to quantitatively assess viability of southern koalas over a particular timeframe a population viability analysis

135 Dr Alistair Melzer, *Submission 7*, p. 1.

136 Threatened Species Scientific Committee, *Advice to the Minister for Environment, Protection, Heritage and the Arts from the Threatened Species Scientific Committee (the Committee) on Amendment to the list of Threatened Species under the* Environment Protection and Biodiversity Conservation Act 1999 *(EPBC Act)*, September 2010, p. 18.

137 Threatened Species Scientific Committee, *Advice to the Minister for Environment, Protection, Heritage and the Arts from the Threatened Species Scientific Committee (the Committee) on Amendment to the list of Threatened Species under the* Environment Protection and Biodiversity Conservation Act 1999 *(EPBC Act)*, September 2010, p. 19.

138 Threatened Species Scientific Committee, *Advice to the Minister for Environment, Protection, Heritage and the Arts from the Threatened Species Scientific Committee (the Committee) on Amendment to the list of Threatened Species under the* Environment Protection and Biodiversity Conservation Act 1999 *(EPBC Act)*, September 2010, p. 19.

139 Threatened Species Scientific Committee, answer to question on notice, 1 August 2011 (received 10 August 2011), pp 6–7.

> (PVA) model would need to be developed, taking into account all threats including low genetic diversity.[140]

2.109 Despite the TSSC's rejection of a north-south genetic divide, several submitters contended that such a divide does in fact exist. For example Professor Frank Carrick informed the committee that the historic:

> Near extinction (VIC) or complete extinction (SA) of Southern Koalas coupled with widespread translocation from genetically impoverished source populations has produced severe genetic homogenisation & loss of diversity. In QLD by contrast, even the small & artificially established St Bees Island population (small population & small island) has about twice the allelic diversity of the most diverse VIC population and is more than [three times] as diverse as the much larger (population & island) Kangaroo Island population in SA.[141]

2.110 The Australian Koala Foundation argued that these [southern] populations have been through 'at least 3–6 genetic bottlenecks and cannot be considered to have a long term genetic viability'.[142] Concerns about the sustainability of the 'southern' koala were shared by several other submitters.[143]

2.111 Finally, Professor Carrick and other koala experts argued that there has been little or no genetic interactions between the northern and southern populations:

> ...mitochondrial DNA (mtDNA) data show that there has been little or no gene flow between some populations for probably a few thousand years. There is now essentially almost zero probability of gene flow between the major Koala populations and there is compelling evidence that neutral nuclear markers can differentiate in decades, not centuries.[144]

Concerns with current estimates

2.112 Due to a number of factors, such as the wide-range of the koala and the inherent difficulty in counting the tree-dwelling marsupials, conducting population surveys of koalas is difficult and expensive. Neither the Commonwealth government, nor the state governments in jurisdictions where the koala occurs has conducted extensive surveys of substantial koala populations.

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140 Threatened Species Scientific Committee, answer to question on notice, 1 August 2011 (received 10 August 2011), p. 7.

141 Professor Frank Carrick, *Submission 86*, p. 14.

142 Australian Koala Foundation, *Submission 25*, p. 5.

143 See for example Dr Joanne Loader, *Submission 22, Attachment 1*, p. 37.

144 Professor Frank Carrick, Dr Alistair Melzer, Dr Bill Ellis and Dr Sean Fitzgibbon, *Submission 101*, p. 6.

2.113 It is clear from the evidence provided to the committee that there are significant deficiencies in current population estimates. Advice from the TSSC to the environment minister highlights this fact:

> There is at present no published scientifically peer-reviewed estimate of the total number of koalas in Australia and no definitive past estimate within an appropriate timeframe to enable comparison.[145]

2.114 Members of the TSSC elaborated on this point in their evidence before the committee. Professor Peter Harrison told the committee that the most formidable obstacle to the TSSC's task of assessing whether or not the koala should be listed as threatened is the:

> ...insufficient data on population size and trends across many areas of the range of the koala. The lack of consistent long-term monitoring populations throughout the range of this large, unmistakable diurnal mammal clearly indicates that our nation has a long way to go to adequately monitor and manage its biodiversity.[146]

2.115 The lack of a published scientifically peer-reviewed estimate of the national koala population is a cause of frustration for conservationists, scientists, government environment agencies and industry bodies.

2.116 For example, Koala Action Pine Rivers submitted that they 'consider that estimates of koala populations are inaccurate in all the states of Australia...' and 'question whether in fact the species is sustainable anywhere in its natural range under current management practices'.[147]

2.117 Similarly, Professor Frank Carrick submitted:

> ...anyone who purports to give an accurate figure for the koala population of Australia should be treated with deep scepticism (the data does not exist) – BUT this is not really the key issue: the population trend is far more important than absolute abundance and there are reliable data available. Apart from the abnormal southern populations in Victoria and South Australia, almost all other wild populations that we know about are in decline...[148]

2.118 Industry groups informed the committee that inadequate data on koala numbers were creating poor planning outcomes and impacting negatively on businesses. The Property Council of Australia argued that current broad based

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145 Threatened Species Scientific Committee, *Advice to the Minister for Environment, Protection, Heritage and the Arts from the Threatened Species Scientific Committee (the Committee) on Amendment to the list of Threatened Species under the* Environment Protection and Biodiversity Conservation Act 1999 *(EPBC Act)*, September 2010, p. 20.

146 Professor Peter Harrison, Member, Threatened Species Scientific Committee,

147 Koala Action Group Pine Rivers, *Submission 41*, p. 2.

148 Professor Frank Carrick AM, *Submission 86*, p. 4. Emphasis in original.

mapping of koala habitat and populations 'have proved false upon further investigation by the private sector'.[149]

2.119 According to the Property Council the poor surveying of koalas has led to significant costs to the industry, including:

> ...substantial project delays, increased holding costs, business uncertainty and substantial additional consultancy fees which have had a direct impact on the ability to deliver affordability.[150]

2.120 The Urban Development Institute of Australia (Queensland) similarly disputed the accuracy of current estimates of koala population numbers:

> ...in Queensland, issues around Koala population protection are very substantially affected by emotional or other views based on values which can lead to incorrect outcomes. It is critical that this hyperbole is stripped away and true scientific measures utilised.[151]

2.121 In its most recent consideration of listing the koala as vulnerable under the EPBC Act, the TSSC stated that 'better demographic data are needed' to determine whether the koala is indeed vulnerable.[152] According to the TSSC:

> The body of data on the status of koala populations is patchy, often sparse and not nationally comprehensive or coordinated. The data quality is also variable. There has been only limited improvement in quality, relevance and integration of these data over the 15 years that the koala has been considered by this Committee and its predecessor. This situation is not unusual for the Committee but what is unusual is the huge area of occurrence and variability that the koala demonstrates. I[n] addition there is a lack of any consistent reliable methodology for population monitoring of the koala.[153]

2.122 The TSSC commented that whilst there are some regions that have high quality population data (such as south-east Queensland and some areas of coastal New South Wales), many other regions have estimates based on anecdotes or opinions, or are extrapolated from adjoining areas.[154]

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149 Property Council of Australia, *Submission 39*, p. 4.

150 Property Council of Australia, *Submission 39*, p. 4.

151 Urban Development Institute of Australia (Queensland), *Submission 52*, p. 1.

152 Threatened Species Scientific Committee (TSSC), 'Letter to the Minister for Sustainability, Environment, Water, Population and Communities regarding the conservation status of the koala', 30 September 2010, p. 1.

153 Threatened Species Scientific Committee (TSSC), 'Letter to the Minister for Sustainability, Environment, Water, Population and Communities regarding the conservation status of the koala', 30 September 2010, p. 2.

154 Threatened Species Scientific Committee (TSSC), 'Letter to the Minister for Sustainability, Environment, Water, Population and Communities regarding the conservation status of the koala', 30 September 2010, p. 2.

2.123 It was recognised that on the best available information presented to the TSSC that koala populations in south east Queensland and northern New South Wales have experienced 'a generally consistent pattern of decline in recent years'.[155] However, some populations in South Australia and Victoria are increasing.[156] The main threats to koala populations were recognised to be habitat loss and disruption, impacts associated with cars and dogs and disease.[157]

2.124 In its professional judgement, the TSSC did consider 'that the national population may have declined by about 30 per cent over three koala generations.'[158] However it went on to say:

> Despite this the Committee has considerable uncertainty that the figure it has reached and recommends that a final conclusion would require that critical data gaps are filled.
>
> The Committee recommends that this could be achieved by giving urgent attention to koala population distribution and demographics in Queensland and New South Wales.[159]

2.125 Professor Frank Carrick told the committee that the current situation in which the TSSC requests additional data on koala populations without the Commonwealth providing funding is proving to be the 'ultimate catch-22':

> The Commonwealth authorities have persistently refused applications to provide funding for koala surveys and establishment of long-term monitoring sites. They then use the absence of detailed quantitative data at intervening points on a broad scale as a reason to refuse to recognise the clear evidence of the decline in those populations we do have hard data for. Then they use that to justify failing to list the koala under the EPBC Act, so

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155 Threatened Species Scientific Committee, 'Letter to the Minister for Sustainability, Environment, Water, Population and Communities regarding the conservation status of the koala', 30 September 2010, p. 2.

156 Threatened Species Scientific Committee, 'Letter to the Minister for Sustainability, Environment, Water, Population and Communities regarding the conservation status of the koala', 30 September 2010, p. 2.

157 Threatened Species Scientific Committee, 'Advice to the Minister for Environment, Protection, Heritage and the Arts from the Threatened Species Scientific Committee on Amendment to the list of Threatened Species under the *Environment Protection and Biodiversity Conservation Act 1999*', pp 10–17.

158 Threatened Species Scientific Committee, *Advice to the Minister for Environment, Protection, Heritage and the Arts from the Threatened Species Scientific Committee (the Committee) on Amendment to the list of Threatened Species under the* Environment Protection and Biodiversity Conservation Act 1999 *(EPBC Act)*, September 2010, p. 27.

159 Threatened Species Scientific Committee, *Advice to the Minister for Environment, Protection, Heritage and the Arts from the Threatened Species Scientific Committee (the Committee) on Amendment to the list of Threatened Species under the* Environment Protection and Biodiversity Conservation Act 1999 *(EPBC Act)*, September 2010, p. 27.

> this restricts access to survey and monitoring funds and so it ever goes on. Move over, Joseph Heller! This is the ultimate catch-22.[160]

The way forward

2.126 The vast extent of koala range (over 1 million square kilometres), the frequent low density of populations, as well as issues such as the sufficiency of monitoring resources and access to remote regions, make large scale assessment of the status of koala populations extremely difficult. To fill the gaps in population data, it was suggested by koala researchers that long-term monitoring of key koala populations (such as the Mulga Lands of western Queensland and Mumbulla State Forest on the south coast of New South Wales) be established.[161]

2.127 Dr Alistair Melzer recommended that koala ecology monitoring stations in key biogeographic regions and zones of interest be established to monitor trends over a number of years.[162]

2.128 The Koala Research Network believes that key long-term monitoring stations would give more accurate and diverse data on koala populations which is required for their conservation:

> Long term monitoring data to estimate trends are much more important than just knowing how many animals there are because this tells something about the direction and rate of change.[163]

2.129 A second priority raised by the Koala Research Network in conducting population research was for the koala research community to adopt a national approach to koala monitoring:

> It is becoming increasingly important to develop national standards and guidelines for assessing and comparing the overall health status of koala populations and for deriving meaningful population estimates. This work will be vital for ongoing prioritisation of recourses and conservation programs, for monitoring trends, and for evaluating the performance of conservation measures.[164]

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160 Professor Frank Carrick AM, Private capacity, *Committee Hansard*, 1 August 2011, p. 4.

161 For example see: Dr Alistair Melzer, *Submission 7*, p. 8; Koala Research Network, *Submission 29*, p. 2; University of Queensland Koala Ecology Group, *Submission 42*, pp 1–3; and Conservation Council ACT Region, *Submission 61*, p. 2.

162 Dr Alistair Melzer, *Submission 7*, p. 8. Dr Melzer has maintained long-term monitoring stations in Queensland for periods up to 12 years.

163 Koala Research Network, *Submission 29*, p. 2.

164 Koala Research Network, *Submission 29*, p. 2.

2.130 The Conservation Council ACT Region also agreed with the need to develop better standards for monitoring population trends while acknowledging the legitimacy of different perspectives.[165]

2.131 A lack of funding was also highlighted by the University of Queensland Koala Ecology Group as hindering the gathering of accurate data on koala populations. According to the group:

> Koala population estimates have, in the past, relied generally on indirect methods of assessment, probably as a result of a lack of funding limiting more comprehensive investigations. As a result, there is some uncertainty about the extent of koala declines in areas of their range...Were these studies properly funded from the beginning, it is unlikely that the current data gaps would exist.[166]

2.132 The *National Koala Conservation and Management Strategy 2009–2014* contains as one of its outputs the need to develop a better understanding of koala population requirements and maintain an information network to guide planning and natural resource management processes.[167] Two direct actions are listed in the strategy to achieve this output:

- develop standard monitoring/habitat assessment protocols to enable population numbers or density to be compared between the same place at the same time; and
- establish a national database of koala population distribution and density to facilitate planning at all scales that is accessible by relevant authorities.[168]

2.133 The first implementation report of the *National Koala Conservation and Management Strategy 2009–2014* , showed that apart from some limited activity in NSW, nothing is being done to develop standard monitoring protocols.[169] The major

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165 Conservation Council ACT Region, *Submission 61*, p. 2.

166 University of Queensland Koala Ecology Group, *Submission 42*, pp 1–3.

167 Output C, Natural Resource Management Ministerial Council, *National Koala Conservation and Management Strategy 2009–2014*, Department of Environment, Heritage and the Arts, Canberra, 2009, p. 4.

168 See Action 1.06 and Action 1.07, 'Appendix 1: Implementation plan', Natural Resource Management Ministerial Council, *National Koala Conservation and Management Strategy 2009–2014*, Department of Environment, Heritage and the Arts, Canberra, 2009, pp 25–26.

169 Natural Resource Management Ministerial Council, *National Koala Conservation and Management Strategy 2009–2014, First Implementation Report to the National Resources Management Ministerial Council*, April 2010, p. 12, www.environment.gov.au/biodiversity/publications/koala-strategy/implementation-report.html, (accessed 21 July 2011).

activity listed to establish a national koala database is ongoing discussions between the Australian Government and the Atlas of Living Australia.[170]

2.134 The TSSC has also advocated for a national koala monitoring and evaluation program:

> A properly designed, funded and implemented national koala monitoring and evaluation program across the full range of the koala is imperative. This should be part of the proposed *National Environmental Reporting System* and would coincidentally provide valuable data on a number of other important species, and areas of key habitat for achieving conservation objectives.[171]

2.135 The TSSC indentified priority areas as:

> ...(1) broad-scale sampling/survey (to provide distributional and abundance information) in those regions for which koala occurrence is least known (particularly including Desert Uplands, Brigalow Belt, Einasleigh Uplands, and central coast of Queensland, as well as inland NSW). The public mail survey method (or an online equivalent) used by Lunney et al. (2009) may provide a useful initial mechanism for this inventory. (2) continue to monitor koalas (and their food trees) in the Mulga Lands region, to assess the extent of recovery (if any) following the cessation of the drought.[172]

Committee comment

Difficulties measuring koala numbers

2.136 The committee acknowledges the inherent difficulties in measuring koala numbers. Making an accurate count of these tree-dwelling marsupials which remain motionless for large parts of the day and which are scattered throughout a range of more than one million square kilometres will always prove highly challenging. In the committee's view this will be an ongoing aspect of determining koala numbers and assessing their status under the EPBC Act (discussed in chapter 5). The committee accepts that the exact koala population is unknown and that there has been no comprehensive counting of koala numbers across the country.

2.137 For this reason the committee believes it is preferable to focus on an estimated population range rather than a precise population number. In this regard the committee notes the most often quoted national estimation of koala populations comes from the

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170 Natural Resource Management Ministerial Council, *National Koala Conservation and Management Strategy 2009–2014, First Implementation Report to the National Resources Management Ministerial Council*, April 2010, p. 13.

171 Threatened Species Scientific Committee (TSSC), 'Letter to the Minister for Sustainability, Environment, Water, Population and Communities regarding the conservation status of the koala', 30 September 2010, p. 3.

172 Threatened Species Scientific Committee, answer to question on notice, 1 August 2011 (received 10 August 2011), p. 7.

Australian Koala Foundation which estimates a minimum of 43 000 koalas left in Australia and a maximum of 84 000. The committee also notes the TSSC's alternative estimate of the national koala population in 2010 was 'about 300 000', with a 'plausible lower bound' of ' about 200 000 individuals'.[173]

2.138 These figures compare with the TSSC's 1990 estimate of the national koala population of 430 000 individuals.[174]

2.139 The committee accepts the 'data-interpretation challenges' faced by the TSSC and its observation that the species 'lacks precise population trend data in significant parts of its range.'[175] These challenges in population data were also expressed by the TSSC in the 2006 attempt to list the koala.[176]

Marked decline

2.140 The committee agrees that the available scientific research points to a marked decline in the overall koala population,[177] with several important areas suffering very significant declines. However the committee accepts that the extent of this decline across the country is not fully known and also that some koala populations, primarily in southern Australia, appear to be stable or increasing. The committee notes however that in many areas across its range the koala population is expected to continue to decline.

Regional trends

2.141 From the evidence presented to the committee two generalised regional trends in the koala population are apparent. Broadly speaking, koala populations scattered throughout parts of Queensland and New South Wales are showing 'a consistent pattern of decline'. This trend was anticipated as far back as the mid-1980s by the National Parks and Wildlife Service in the *National Koala Survey*. Koala numbers in some regions, such as south eastern Queensland and parts of costal New South Wales,

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173 Threatened Species Scientific Committee, answer to question on notice, 1 August 2011 (received 10 August 2011), p. 2. The TSSC declined to provide the committee with an upper bound.

174 Threatened Species Scientific Committee, answer to question on notice, 1 August 2011 (received 10 August 2011), p. 2.

175 Threatened Species Scientific Committee (TSSC), 'Letter to the Minister for Sustainability, Environment, Water, Population and Communities regarding the conservation status of the koala', 30 September 2010, p. 1.

176 Threatened Species Scientific Committee, 'Advice to the Minister for Environment and Heritage from the Threatened Species Scientific Committee (the Committee) on Amendments to the list of Threatened Species under the *Environment Protection and Biodiversity Conservation Act 1999*', 2006, p.14.

177 Threatened Species Scientific Committee, letter to Minister for Sustainability, Environment, Water, Population and Communities, September 2010, Department of Sustainability, Environment, Water, Population and Communities, *Submission 73, Attachment C*, p. 1.

have been accurately counted. In these populations it is clear that koala populations are declining significantly. The committee also notes that koalas in Queensland and New South Wales provide the highest genetic diversity across the species range.

2.142 By contrast the populations in Victoria and South Australia are in general relatively abundant and stable, with certain populations increasing and requiring active management to prevent habitat destruction through over-browsing. In areas where koala numbers have become overabundant, such as Kangaroo Island in South Australia and French Island, Raymond Island and Tower Hill State Game Reserve in Victoria, state governments have implemented sterilisation and translocation programs to mitigate these impacts. The committee notes that koalas in these areas originate from limited genetic stock and consequently display much lower genetic diversity, with some submitters questioning their long-term viability. The committee also notes that the abundant populations in Victoria are largely 'a function of the translocation program that has been operating for several decades.'[178]

2.143 To resolve this situation, and to address the potential for large depauperate southern populations from skewing the national koala estimate, the committee believes there is a need for further scientific research into the genetic diversity of the koala. This should include a population viability assessment as recommended by the TSSC for the southern koala as well as a thorough genetic analysis across the entire range of the population. The committee notes the difficulties expressed by submitters and witnesses in previously securing such funding and accordingly recommends that the Australian Government fund this important research. Such a study would allow an assessment to be made about the viability of the bottlenecked populations of the south and better identification of priority conservation areas, such as the Strzelecki and Mumbulla populations.

Recommendation 1

2.144 The committee recommends that the Australian Government fund research into the genetic diversity of the koala including a population viability assessment of the southern koala and determining priority areas for conservation nationally.

Population data deficiencies

2.145 The committee is concerned about the deficiencies in koala population data, both current and historical. More robust information on the koala's population status will necessarily lead to better decision-making about the most important and effective conservation and management strategies.

178 Threatened Species Scientific Committee, *Advice to the Minister for Environment, Protection, Heritage and the Arts from the Threatened Species Scientific Committee (the Committee) on Amendment to the list of Threatened Species under the* Environment Protection and Biodiversity Conservation Act 1999 *(EPBC Act)*, September 2010, p. 21.

2.146 In the committee's view, if the koala's long-term viability is to be secured for future generations, then there is a critical need for better population information. Clearly, more resources and dedicated commitment are needed to achieve this outcome and the committee recommends greater Commonwealth involvement in this area, including through the provision of financial support. In this regard the committee supports the TSSC's call for 'a properly designed, funded and implemented national koala monitoring and evaluation program across the full range of the koala is imperative.'[179]

Recommendation 2

2.147 The committee recommends that the Australian Government fund a properly designed, funded and implemented national koala monitoring and evaluation program across the full range of the koala.

2.148 This could be facilitated as part of the Koala Research Network's integrated research proposal which is supported by the committee and which is discussed further in Chapter 4.

2.149 To effectively implement such a program, the government must encourage relevant state and local governments as well as community and business organisations to participate fully in this initiative. The government should also give preference to 'critical data gaps' such as those identified by the TSSC in Queensland and New South Wales.[180] In particular, urgent priority should be given to 'broad-scale sampling/survey...in those regions for which koala occurrence is least known (particularly including Desert Uplands, Brigalow Belt, Einasleigh Uplands, and central coast of Queensland, as well as inland NSW)' and to 'continue to monitor koalas (and their food trees) in the Mulga Lands region [in Queensland], to assess the extent of recovery (if any) following the cessation of the drought'.[181]

Availability of biodiversity information

2.150 On the related matter of the availability of biodiversity information more generally, the committee notes the TSSC's statement to the Environment Minister that:

> ...the interpretative challenge of determining the status of the koala is a symptom of a more general problem. Biodiversity in Australia is in decline but the available data to inform priorities and actions are generally

179 Threatened Species Scientific Committee (TSSC), 'Letter to the Minister for Sustainability, Environment, Water, Population and Communities regarding the conservation status of the koala', 30 September 2010, p. 3.

180 Threatened Species Scientific Committee, *Advice to the Minister for Environment, Protection, Heritage and the Arts from the Threatened Species Scientific Committee (the Committee) on Amendment to the list of Threatened Species under the* Environment Protection and Biodiversity Conservation Act 1999 *(EPBC Act)*, September 2010, p. 27.

181 Threatened Species Scientific Committee, answer to question on notice, 1 August 2011 (received 10 August 2011), p. 7.

> inadequate, being both insufficient and uncoordinated. A consequence is that we are not making well informed investment decisions. The Committee would welcome a formal request from you to provide an advice on this critical issue.[182]

2.151 The TSSC elaborated on this point in its response to the committee's questions on notice:

> We recommend a nationally coordinated integrated program for population monitoring of threatened plant and animal species (and other species of cultural, evolutionary and/or economic significance). Such monitoring should (i) provide timely warning of unacceptable declines that automatically triggers alerts that require immediate management actions to ameliorate or halt the decline to enable population recovery, (ii) measure the effectiveness of conservation management responses (and hence help continually refine and adapt that management), and (iii) provide a headline index of the nation's environmental progress that can be counterpointed with more traditional economic and human demographic indices.[183]

2.152 The committee supports this perspective, and in particular the TSCC's caution regarding poorly informed investment decisions and the need for a nationally coordinated and integrated program for population monitoring of threatened species and other culturally, evolutionary and/or economically significant species.

Recommendation 3

2.153 The committee recommends that the Australian Government establish a nationally coordinated and integrated program for population monitoring of threatened species and other culturally, evolutionary and/or economically significant species.

Standardised counting methodologies

2.154 The committee notes the range of methods used by different researchers and organisations to count koalas. The committee acknowledges that there may be preferred methods depending on the location and population density as well as other relevant factors. However, in the committee's view the suite of different methodologies has led to a degree of unwanted and unnecessary uncertainty regarding koala population estimates. The committee supports the consolidation of counting methods, and encourages researchers and other interested organisation to collaborate in order to agree to a set of standardised counting methods. This is not an endorsement of a single methodology to be used across the entire country, but instead a proposal for

182 Threatened Species Scientific Committee (TSSC), 'Letter to the Minister for Sustainability, Environment, Water, Population and Communities regarding the conservation status of the koala', 30 September 2010, p. 3.

183 Threatened Species Scientific Committee, answer to question on notice, 1 August 2011 (received 10 August 2011), p. 8.

an agreed set of methodologies, with each to be used in an agreed set of circumstances.

Recommendation 4

2.155 The committee recommends that the Australian Government assist the koala research community and interested organisations to work towards a standardised set of methodologies for estimating koala populations.

TSSC advice

2.156 In addition to supporting the gathering of better population data and the adoption of standardised counting methodologies, the committee believes that the Environment Minister must be presented with the best available information upon which to base his or her listing decision. In this regard the committee has some concerns about the TSSC's advice provided to the Minister in September 2010.

2.157 For example, on the critical question of the current koala population, the TSSC simply advised the Minister that 'the koala population is greater than 200 000 individuals'. However it is unclear from the TSSC's analysis of the existing population data, how it determined this figure.[184] Although it did provide a national estimate (300 000) and a 'plausible lower bound' (200 000) for this inquiry, the TSSC did not provide either of these figures to the Minister. Similarly, the TSSC did not provide the necessary figure for historical comparison to the Minister, despite providing it (430 000 in 1990) to the committee for this inquiry.

2.158 It is surprising to the committee that nowhere in its advice to the Environment Minister, did the TSSC include its conclusion that the national koala population in 2010 was 300 000. The only figure that was included was the figure of 'greater than 200 000 individuals' which itself was included at page 27 of its advice. In the committee's view, whilst acknowledging the complexity of its task of assessing the conservation status of species against the detailed EPBC Act criteria, the TSSC must be far clearer in its future advice to the Environment Minister. Headline information, such as species population figures, must be presented in an easily understandable manner and in a prominent position within the advice.

2.159 In the committee's view it is imperative that the statutory body, which has a legislated role to provide advice to the Minister on the conservation status of species being considered for listing as threatened,[185] provides its assessment of the population

184 In its advice to the Environment Minister the TSSC sets out the following state-based figures (pp. 20–27): South Australia – between 12 000 and 16 000 in 2006; Victoria – 'roughly 73 500' date unspecified; NSW – 1000 to 10 000 in 2008; Queensland – approximately 39 753 in 2007 to 2010 (derived from 29 050 in 2010 from Southwest Queensland and 10 703 in 2007 and 2008 from Southeast Queensland) which totals a range of between approximately 126 000 to 139 000.

185 *Environment Protection and Biodiversity Conservation Act 1999*, s. 503.

range (both current and historical) based on the best available information. The committee acknowledges that the constraints of current best available information may lead to a wide population estimate range. However, without such a range, it must be very difficult for the Minister to make an informed decision on the current listing assessment for the koala as well as other listing decisions. Given the inherent difficulties in obtaining accurate koala numbers, without clear TSSC guidance on an estimated population range, the Minister is put in a very difficult position. As data deficiencies are not unique to the koala's circumstances, it is vital that for all future listing assessments, the TSSC provide the Minister with the clearest information possible, based on the best available information.

Recommendation 5

2.160 The committee recommends that the Threatened Species Scientific Committee provide clearer information to the Environment Minister in all future threatened species listing advices, including species population information, and that the Threatened Species Scientific Committee review its advice to the Minister on the listing of the koala in light of the findings of this inquiry.

2.161 Further discussion on the related matter of the threatened listing of the koala is included in chapter 5.