



Received: 10-02-2026  
Accepted: 20-03-2026

ISSN: 2583-049X

## **When you Log Trees on a Property in the Australian Outback; Careful you don't Knock Koalas to the Rocky Ground**

**Deborah J Hilton**

Aweta St, Ashwood VIC 3147, Australia

DOI: <https://doi.org/10.62225/2583049X.2026.6.2.6034>

Corresponding Author: **Deborah J Hilton**

### **Abstract**

Ecological factors, drivers and mitigators are topical issues on the global agenda influencing habitat and species loss. These factors are impacted by policy and management decisions that relate to biodiversity conservation and the prevention of extinction.

Globally there are many examples of laws and policy designed to protect species worldwide, with monitoring, regulation or amendments occurring as changes happen whether it be progress, improvements, deterioration or even extinction occurring or eventuating. Ecological factors including habitat loss, tree felling and logging can contribute to species extinctions. Policy, legislation, adequate resources, biosecurity, processes for monitoring threatened species and public involvement are essential mechanisms for action.

In order to review the literature, pubmed MESH was utilised

[pubmed MESH]. The search was as follows; ("Endangered Species"[Mesh]) AND "Environment"[Mesh] adding the text word 'Law' and then the text word 'Australia'. Various of the retrievals are mentioned below to highlight issues of importance. A summary of various global actions is given and then there is a focus on Australian endangered species. Following that various literature on using photography and visual images for awareness or to portray an issue is spoken about and then there is a mention of the world renowned Earthshot prize. Lastly, Hilton's usage of photography in previous public health manuscripts is described. In conclusion specific to this project, a photographic repository available for usage is mentioned that includes photos of the endangered koala. Hopefully these pictures heighten knowledge and initiate action to protect these beautiful, iconic, much-loved marsupials that are native to Australia.

**Keywords:** Climate Change, Environment, Endangered Species, Phascolarctidae

### **1. Global and Australian Issues Related to Biodiversity Protection as a Result of Environmental Policy and Law**

#### **1.1 Global Research**

As stated in the summary, in order to review the literature, pubmed was utilised. The MESH was utilised [pubmed MESH <https://www.ncbi.nlm.nih.gov/mesh/>] [Pubmed MESH] <sup>[1]</sup>. The search was as follows; ("Endangered Species"[Mesh]) AND "Environment"[Mesh]. This was repeated adding the text word 'Law' and then the last search in addition added the text word 'Australia'. The retrieval count for the first search was 6668 retrievals, while the second was 338 and the third was 35 retrievals.

Wildlife protection laws are designed to mitigate species loss. The globally endangered Bengal tiger in the Bangladesh Sundarbans was investigated with an analysis of the combined effects of climate change and sea-level rise and how this may result in habitat loss with a subsequent effect on the endangered species <sup>[2]</sup>. Habitats are more affected by climate change which has a greater effect on species numbers as compared to that of sea level rise.

Another species, the tiger (*panthera tigris*) populations which are sought after for poaching and for tiger parts, are in danger <sup>[3]</sup>. This publication in 2018, stated that in Nepal there are less than 200 of the Bengal tiger (*Panthera tigris tigris*) remaining.

If we now turn to water creatures, a manuscript reports on observed harvest breaches of current Brazilian environmental laws, in regards to the capture of sharks by fishers <sup>[4]</sup>. This occurs as a result of combined factors including not knowing the environmental laws, or a lack of enforcement of laws by powers that be, and also due to the fact breaches may occur due to the fact fishers have no other means of income so rely upon this work.

Categorizing species' extinction risk with varying decision rules helps to develop quantitative criteria under the U.S. Endangered Species Act [5]. Biodiversity and habitat loss is addressed by the United Nations whom focus on globally protected areas (PAs) and while these measures reduce habitat loss, their effectiveness on animal diversity is uncertain [6]. Illegal tree felling and unregulated hunting affects protected areas in terms of habitat quality and protection of species. Leakage is the term where these actions are shifted to unprotected areas.

Large old trees which may be part of forests, deserts and savannas and other areas in all environments including tropical and temperate conditions were discussed in a manuscript by Lindenmayer and Laurance [7]. The presence of large old trees has a strong influence on not only other plant species but animal species also. Climate change, logging, land clearing and fragmentation of the landscape pose threats to environmental preservation. Land sparing, where high intensity logging is combined with the protection of intact primary forest reserves, maximizes the biological value [8].

## 1.2 Australian Research

More specifically in Australia, various authors report on three endemic Australian vertebrate species—the Christmas Island pipistrelle (*Pipistrellus murrayi*), Bramble Cay melomys (*Melomys rubicola*), and Christmas Island forest skink (*Emoia nativitatis*) that became extinct from 2009 to 2014 [9].

Another research study, reports that commencing in 2001 for the next eight years, a critically endangered population of grey nurse shark was protected as a result of 26 marine-protected areas (MPA) being established on the east Australian seaboard [10]. These measures included negotiation between the Australian states of New South Wales (NSW) and Queensland, as well as the Commonwealth (Federal) government, in addition to negotiation and consultation with fisheries and conservation departments in the states.

Another example from Australia includes modelling and prediction for existing regional-scale habitat models being a case study of threatened and common insectivorous bats in South-Eastern Australia including two morphologically similar species with differing conservation status [11]. Habitat type (based on vegetation community) best explained activity of both species and these are practical and necessary conservation predictors.

The koala (*Phascolarctos cinereus*) (from the Greek *phascolarctos* meaning leather pouch and bear, *cinereus* ashen grey in colour) is Australia's most admired native animal [12]. This manuscript in 1975 states that Koala's eat 600 g of leaf/ day. Historically they were the subject of the fur trade during the latter half of the last century and up to the 1920's.



**Picture 1:** Koala balancing on a tree; Photograph taken by Mr Stephen Hilton

According to the World Wildlife Fund Australia website, koala's can be found in trees in Eucalyptus forests up and down the east coast of Australia and they can be viewed as one of Australia's most iconic and beloved animals [13]. From Queensland beaches to South Australia's woodland areas, koalas can be seen. The Forests are not only providing food in terms of eucalyptus leaves, but they provide a home and shelter for koalas. This website states that they can eat up to 500 grams of leaves per day [slightly different to the author above, but this website is more recent, as opposed to the other publication being in 1975]. Koalas are often finicky and find the best leaves. Agricultural destruction is not the only factor impacting koala numbers, but road traffic carnage, disease and attacks by other animals affect koala numbers. Koalas spend a lot of time in the trees and in fact, they can spend up to 5/6th of the day sleeping. Research studies of koalas date back many decades [14]. This study in particular reports that marsupials show a distinct advance on monotremes in heat regulation via evaporative mechanisms. In fact, an increasing ascending order was reported as: bandicoot, possum, cuscus, koala, wallaby and wallaroo. Animals employing evaporative methods are more distressed in humid atmospheres compared with those that have other methods of heat disposal. Almost two decades on from the research study above, Dickens report that in essence, the future of the koala is uncertain, not only due to a diminishing habitat which can affect the food supplies, but catastrophes such as bushfires may compromise [12].

Two groups of koalas were investigated during a central Queensland drought to note the potential impacts of climatic variability [15]. Physical attributes of trees, including their ability to “buffer” koalas against extremes of ambient temperature are important to selection by koalas. Furthermore, koalas can adapt their behavior, using shady trees during the day.

An investigation into the resilience of this folivorous marsupial, the koala *Phascolarctos cinereus* was performed with respect to the effect of retention forestry [16]. Acoustic recorders recorded bellows and bellow rate, while sites were stratified with various logging variables, including old growth. Retention forestry helps mitigate harvesting impacts significantly with respect to biodiversity. The authors concluded that local examinations with respect to koalas are warranted.

Habitat destruction, due to urbanisation, along with climate change can destroy the integrity of koala habitats [17]. Rainfall and temperature changes can affect the bracket where food and non-food trees are viable. The relative content of toxic chemicals in leaves may be affected by climate change–related changes. Modelling and forecasting are important to understand the koala distribution.

So, in essence, the future of the koala is uncertain, as not only due to a diminishing habitat which affects their food supplies, but climate catastrophes such as bushfires [12]. In the case of the koala, also inland habitats are likely to become climatically unsuitable [18].

Other researchers have also predicted that climate change will adversely affect Australia’s koala distribution [19]. The authors reported that novel temperature-sensitive intra-abdominal implants are suitable as a surgical approach for monitoring the koala’s core body temperature. Various of these authors mentioned above, along with other colleagues also state that surgically implanted thermal radio transmitters and data loggers are effective in measuring the body temperature of free-ranging koalas in various environmental situations and temperatures [20].

The 2019/20 bushfire season impacted the populations of wild koalas (*Phascolarctos cinereus*) [21]. Field sites [n=123] where current koala generation pre-fire survey data were available included six fire grounds on the north coast of New South Wales. Compared with fully burnt forest canopies, koala survival was five times more likely in Unburnt or Partially burnt areas.

## 2. Visual and photovoice theory, methods and research for conveying evidence or impressions

Alerby in a book chapter writes on the very topic of a picture telling more than a thousand words [22]. The author speaks about how in our Western Culture written text is the common language. However, there is also symbolic and visual communications or so called ‘non-verbal’ language.

Alerby's study, "A Way of Visualising Children's and Young People's Thoughts about the Environment: A Study of Drawings," reviews young folks' interpretations about our environment [23]. The need for a clean and unspoilt environment, free of destruction where people can live and relax, and care for the environment were ideas uncovered.

The camera allows an exploration and navigation of situations including changes that may occur over time [24]. The camera lens can be used for visual research and analysis. Giving young folk a voice in research involves having them involved in how it is produced, what it

represents, how it is used and lastly how it is interpreted [25]. The epistemological understanding of meaning and the purposes of the importance of voice as a window to the world is crucial. This centers on giving visual accounts using visual evidence to over time construct ethnographically and reflexively situations.

While on a differing topic to environmental protection, being that of the COVID pandemic. The National Portrait Gallery, Hold Still exhibition lead by the Princess of Wales, Patron of the Gallery, was a very determined community collective photography project to highlight issues in the UK during the Covid-19 lockdown [26]. There were three themes being Helpers and Heroes, Your New Normal and Acts of Kindness. Given there were over an incredible 31,000 submissions received no doubt the judges had a difficult, monumental and laborious task before them to select the final 100 portraits.

An overview of published work on Photovoice, seeks to identify how the method can capture climate change aspects, as a result of critically appraising the literature [27]. This is in terms of community understanding, perceived impacts, perspectives on vulnerabilities, local adaption strategies and revolutionary learning. Theory must be considered, in addition to collaborating with agencies that will increase the likelihood of policy and community changes.

Another manuscript on photovoice describes it as a participatory photography research method that is increasingly being used [28]. The manuscript reports on a review of 132 articles where environmental change affecting social groups and communities as a result of this methodology is considered. Different perspectives, emotions and epistemologies are uncovered. This helps to create a dialogue tool for people to increase awareness and promote advocacy, thus leading to action.

## 3. Global Initiatives – the Earthshot Prize

Environmental and planetary crises were addressed in November 2020 by HRH Prince William who launched the Earthshot Prize, which was to champion and encourage inspiring solutions globally [29]. The document references Kennedy's Moonshot programme, aiming to land a man from the USA on the moon before the end of the 1960s. Innovative and workable solutions are awarded that address important issues promoting concrete change in the concerning areas of air, oceans, climate, waste and nature.

According to the Earthshot Prize website, as of early Feb 2026, there have been 5,669 solutions considered, 75 finalists and 25 winners [<https://earthshotprize.org/>] [30]. This is an exceptionally generously awarded prize, as each year this decade, HRH Prince William and a distinguished Prize Council will award £1 million to five winners which is one per Earthshot.

When I review this website, I note it boasts a superb website that is brilliantly designed, being easy to navigate with drop down lists, including details of the vision, the partners and people who are involved, the winners, the ceremony details and superb photographs. It is most likely highly contested and no doubt extraordinarily difficult to judge. One factor that I envisage as difficult may in fact be that comparisons become problematic when you consider entries from high income countries as opposed to low- and middle-income countries. Putting these on an even keel metaphorically speaking may be awkward.

I do note that when I search on the website with the search word 'Africa' I retrieve 97 results. The 2nd of these listings is a title; Africa Innovates, which details local filmmakers telling 15 stories of change. This is a focus on these transforming innovative solutions brought about by local African people. There is another retrieval from that search that is focusing on Africa's innovators being the Sea Point Photography Exhibition that opened in Cape Town. The exhibition that potentially can impact the country focuses on fashion circularity, e-mobility, humans and wildlife in reciprocity and solar powered storage and partnered with Crtve Development and Bad Mama Jama Films. These two examples hence show that the prize is all inclusive of countries globally and not biased at all.

Hence, while I envisage that it may be difficult to judge given differing income countries can make it problematic, I'm sure that a superb most brilliantly organised and administered prize such as this does take these factors into account when choosing the winners. Regardless of the fact that there are only five innovators who can win the Prize each year, having so many entrants means that the community involved in Earthshot this decade potentially promotes hundreds of solutions to scale.

#### 4. Hilton's usage of photography as a methodology to heighten awareness, knowledge and understanding of public health issues or to convey evidence or impressions

Hilton has previously utilised Mr Stephen Hilton's creative and realistic photographs in publications on climate change and communication messages, laughter therapy, motorcyclist road traffic safety, cycling and pedestrian safety and a water safety drowning prevention initiative [31, 32, 33, 34, 35, 36].

An international award-winning photograph illustrates how graphics convey climate change communication messages is a manuscript published by Hilton [31]. It details how two photographs taken by S. Hilton won first and second place at the Asia Pacific Academic Consortium for Public Health conference in the photographic competition in 2019 [37]. These stunning photographs can be viewed on this page. The first shows a glorious tree with autumn leaves glistening as the rain drops have fallen on the tree leaves. While S. Hilton is the photographer, D. Hilton wrote the description which is; "Climate change, deforestation, tree logging, global warming, concrete monstrosities either roads, buildings or car parks, causes loss of the forest, butterflies, and the wildlife that inhabit there. This tree with green and autumn leaves, with lovely reflections highlights the beauty of nature that we must protect. Don't destroy our environment."

As previously stated, subsequent to that a manuscript was written and this discusses how photographs convey climate change communication messages [31]. Hilton speaks of how public health committees and policymakers should utilise graphics on policy documents, websites and flyers to have dramatic influence over public opinion in order to stimulate understanding and collective action.

Various photographs by S. Hilton are also included on injury prevention media and print designs. The International Safety Media Awards site [<https://isma-awards.org/about-isma/>] awarded the cyclist photograph taken by Stephen Hilton, an honourable mention award in 2024 for the print injury prevention design created by Hilton [38]. This site has

also awarded Hilton a finalist award for a campaign <\$50,000 for a rock jumping / drowning prevention design in 2024. This latter design has six photographs of an adolescent jumping, merging these photographs such that it shows the descent into the water. A subsequent manuscript including this design has also been published [36].

While these relate to injury prevention, apart from the manuscript on how photographs convey climate change communication messages and another on laughter therapy, the methodology can be sidetracked and utilised accordingly in other domains or specialties. These designs display how photography can be a powerful tool in terms of impacting viewers with visual and graphical details of an issue.

Previously Hilton has also championed for photography to support the American National public health [PH] Week. In 2025, held from April 7-13 it involved collective efforts to keep our communities healthy & safe and these efforts were recognized. The theme was 'it starts here', acknowledging the beginnings, the importance of laying a foundation and the need to take action. She invited interested persons to email photographs to her in support of this theme. Again in 2026, she has advocated for photography to support this time, the Global Public Health Week (GPHW) which is an annual global advocacy initiative of the World Federation of Public Health Associations' (WFPHA) [World Federation of Public Health Associations' (WFPHA) - Global Public Health Week (GPHW)] [39]. This week seeks to mobilize public health actors worldwide to advance equity, strengthen systems, and champion public health as a global public good and this year the week is held from April 6 to 10, 2026, focusing on the interdependence of peace, equity, and public health.

As an example of a sample photograph for this week, I have uploaded a photograph that shows a landscape that is described below. I have created a photography website with a page dedicated to this week and mention this photograph focusing on environmental issues [40]. Please note this page is temporary and will be deleted in due course but details of the photograph may be provided upon request, otherwise it is pictured at the end of this page.

This photograph shows bushland and scrub that is thick and dense. No doubt we saw wildlife, even though none is pictured in this photograph. Not to say that a building will be built here in the next 50-100 years, but as an example if people plan to build complexes in an area, public health efforts should also aim to protect nature to an extent. It must be a balance between creating places for people to reside, work and be entertained, while also keeping landscapes intact to a degree to respect our habitat.



**Picture 2:** Emma, Natasha and Debbie walking through dense bushland somewhere in Australia

It is a vast land of opportunity so careful planning and advice is warranted in order to have a balance between progress towards creating safe accommodation, work and leisure spaces, while maintaining some of our natural heritage and also protecting various species that may live there. Public health efforts should be a balance between creating places for people to reside, work and be entertained, while also respecting our habitat. Caring for nature is very important.

### 5. Potential policy, legislative and media changes to mitigate species loss

Aside from awareness initiatives using visual and photography images as described above, policy and legislative changes are an important avenue also for change. The logging, deforestation and degradation effect on species in New South Wales (Australia from 1750 – current) was described [41]. A baseline was incorporated in order to quantify (2000 – 2022) logging, thus comparing the relative extent of contemporary remaining native forest and woodland. This recent degradation from logging had effects on 244 species previously also affected historically. This historical compared with contemporary viewpoint, puts a perspective on logging highlighting areas for improvement in environmental undertakings. Past losses as a result of decisions made historically are important factors to consider in current times. Hot climate as it effects koalas was reported on [42]. Mella and colleagues report that dry and hot weather will increase in frequency, duration and severity along with drought events. These global climate changes may also impact koalas and other arboreal folivores towards their limit thermally. Australian koala conservation policies need to be proactive anticipating threats and changes so that environmental planning protects koalas living in eucalypt forests [18].

Hilton in a literature review on COVID-19 [coronavirus] research specific to Australia including manuscripts on policy and media releases, describes how comprehending the avalanche of statistical research on COVID-19 [coronavirus] is laborious [43]. Considering in fact that this relates to COVID-19, it may be the case that also understanding the plethora of information on climate change could also be similar.

In terms of tasks, this includes assimilating predictions, forecasts, and diagnostic algorithms which become important for planning, allocation, and meeting the needs of the increasing population disease burden. Assimilation also for climate change literature maybe cumbersome, but it important again for policy, planning, resources and addressing the needs most important. Hilton also stresses that in order to make any policy decision, using evidence-based information as the source is crucial prior to decision making.

The complexity of the policy process is outlined in the manuscript on the purple patch for evidence-based health policy. They state that while evidence to clinical care is relatively linear, it is more complex translating evidence to public policy [44]. The difficulty includes generalisability, the complexity of the process and differing perspectives. The actors in public policy include the Executive arm of federal government – Prime Minister, Ministers and Cabinet [politicians], while the administrative arm includes the public servants. The former is more responsible for policy decisions, planning and carrying out the policy agenda,

while the administrative team may carry out administrative tasks including advice, synthesis and contextualising information.

Policy and legislation change is crucial for change to occur and Hilton describes how policy was considered during the pandemic in terms of the management of the workforce [45]. It is stated that the changes to health services are immense as a result of shutdowns and adapted essential service provisions. Policy has to therefore be adaptable and flexible and this doesn't just apply to pandemics, but other catastrophes such as the climate issue.

Policy changes must always consider evidence. While this relates to humans, not koalas, looking for evidence is important and one such example is fans [46]. Extreme hot weather events lasting for several days are likely to increase in frequency in some parts of the world. These authors even conducted a Cochrane systematic review on the usage of electric fans for reducing adverse health impacts in heatwaves. While the conclusion was that this did not support or refute the use of electric fans during a heatwave, the need for more research including randomised trials comparing the health effects in people with electric fans to those in people without them was required.

A more relevant review of evidence was a manuscript that included 127 articles in order to develop a taxonomy of heatwave impacts [47]. The authors looked at the impact on ecosystems, humans and the environment under 11 thematic pathways. Doing such a task as this, which is comprehensive, allows for the formulation of very robust inclusive heatwave policies and adaptation strategies. One of the thematic pathways considered was the impact on vegetation and wildlife. There is a diversity of information that has to be integrated in order to formulate policy that is versatile.

Heatwaves not only affect nature, affecting food supplies as a result of food crisis and livestock numbers as a result of drought and water stress [47]. These climate events also can contribute to other environmental disaster hazards including floods, landslides, and wildfires so hence these heatwave events impact and threaten existence and the comfort of living beings.

Heatwave, being extremities of heat can also be modulated by climate phenomena such as El Niño and the Pacific Decadal Oscillations [48]. Interdisciplinary research not only promotes awareness but is crucial for the implementation of effective public policy.

Professor Thomas Wernberg, Dr Karen Filbee-Dexter and Dr Shinae Montie, from UWA Oceans Institute and School of Biological Sciences, led the review published in Nature Reviews Biodiversity that assessed climate change that is driving marine heatwaves and thus impacting biodiversity [49]. While this was marine life, heat impacts ecosystems and biodiversity with cascading changes as a result of the impact on habitat and food resources. Management and conservation policies are essential for protection.

Policy as it relates to other species, includes enhancing protected area coverage, consistent monitoring, enforcement of law and the necessity for community awareness all of which combine to become key strategies to protect endangered species [2].

A research study titled; high-frequency data reveal limits of adaptation to heat in animal agriculture by Palandri and colleagues in 2025, reported that extreme heat reduces milk yield by up to 10%, [50]. Technological changes and

management protocols are important in order to mitigate losses. Cooling infrastructure and management adjustments were widely adopted over the last two decades, but these only partially ease losses, reducing them by less than half. Findings such as this are important for policy.

Animals and wildlife pass causing populations to dwindle as a result of ecological damage thus affecting species survival. Research to describe the effect of heatwaves identifies and pinpoints species most at risk thus informing management policy <sup>[51]</sup>. Following bushfires, recovery-themed management regimes for koalas are also important considerations <sup>[21]</sup>.

Interestingly, the total cost of fire in Australia shows that only 29% is for response activities while 14% goes towards the consequences of fire <sup>[52]</sup>. The fact that mitigation investment (86% of the total costs) is over five times the consequences (14%) raises concerns about economic management. Greenhouse gas emission (mitigation) policy is informed by differing climate change scenarios <sup>[53]</sup>. Strong policy action (efforts made now to reduce emissions) compared with no policy action (emissions continue at present high levels with no climate change - specific policies) has an effect on the extent and severity of estimated future health effects including mortality in older Australians.

## 6. The Need for Modernization

There is also the need for buildings and infrastructure to be constructed, as this is essential to Australians in order to have places to live, places to work and there needs to be a way to travel from A to B to C. We require services for transport, energy, water, and communications, and we require community and shopping centers, historical centers and facilities for healthcare and sport <sup>[54]</sup>.

We require buildings for various reasons in that these places are where we work, live and find recreation. They provide us with shelter which is a basic human need and right. We are sheltered from weather events, excessive heat and cold, storms and wind. When we have this infrastructure being places to live, work and find recreation, our lives are substantially improved in terms of output and safety <sup>[55]</sup>. When buildings are being built, builders, planners and officials can follow Ecologically Sustainable Development principles and these may include documents such as the Green Building Council of Australia, Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, International Union for Conservation of Nature, National Australian Built Environment Rating System (Australia), The Nationwide House Energy Rating Scheme (Australia) and The National Construction Code (Australia). These documents are important to reference when planning.

## 7. Defining Heatwaves

It is important that heatwave definitions are created and existing evidence is synthesized and analyzed. Effective policy responses must also rely upon internationally coordinated efforts. It has been suggested that there are two different approaches for defining a heatwave; the structuralist and phenomenological approach and thus this forms criteria for a "good" heatwave definition <sup>[56]</sup>. There are absolute and relative criteria and the definitions have varying degrees of precision. Heatwave attributes (e.g., duration and intensity) can also be described.

Shan and colleagues reported on global climate change and heatwave events that pose problems for our planet, reporting on an analysis and summary of events since 2000 <sup>[57]</sup>. As per other authors they state that these events are increasing. The effects of heatwaves are on temperature, humidity, solar radiation, and the atmosphere including effects on ozone (O<sub>3</sub>), nitrogen-containing pollutants, and secondary particulate matter. One objective and goal is to formulate policy recommendation.

One issue associated with this may be how to define a heatwave <sup>[47]</sup>. The difficulty with a global definition is in part due to the diversity of world climatic parameters and how species and human characteristics cause adaptation. Heatwave definitions are contingent on anthropogenic issues including how humans influence nature as well as on local acclimatization and climatic factors such as maximum and minimum temperatures (T<sub>min</sub>), and relative humidity.

For instance, the United States of America (USA) National Weather Service defines a heatwave as a period of abnormally warm weather lasting at least two days or more, and with either high or low humidity <sup>[48]</sup>. The World Health Organization (WHO) in Europe coordinates EuroHEAT <sup>[58]</sup>. They define a heatwave as when the apparent maximum and minimum temperatures are above the 90th percentile of the monthly distribution for at least two days. The tropical nights index counts the number of days over a certain period with daily minimum temperature exceeding 20 °C <sup>[59]</sup>.

Of course, an independent organisation such as the new Australian Centre for Disease Control and the Bureau of Meteorology would oversee this idea and also be involved in the definition. Hilton has also authored on the topic of the Australian Centre for Disease Control including how the jurisdiction and oversight is to occur and how information will be collated which is a key responsibility of this centre <sup>[60]</sup>.

The proposed new centre will be an expert resource for information and this will focus upon a broad range of topic areas of importance to the Australian end users. Heatwaves, climate change and extreme weather events will certainly be on the agenda. It will become a centre of excellence, an expert hub and repository of resources and technical information. The Centre will be the most significant Public Health infrastructure for health in Australia this century. Governing statutory and regulation, making decisions on independence and dependence with existing entities, and the breath of jurisdiction and practice are key areas identified whereby decisions will be forthcoming. Potentially the Centre will impact millions of lives.

One recently suggested action to curb breaches of environmental protection laws was suggested by MP Ryan, M, in the news report titled; As temperatures continue to rise, it's time to name heatwaves for what they are <sup>[61]</sup>. The MP has also created an online poll where people can vote as to the idea; should heatwaves be named after fossil fuel companies? You tell us <sup>[62]</sup>. The options in the online poll, give examples of naming heatwaves after companies including the following companies; AGL, origin energy, woodside, BHP, Santos, North west shelf, Scarborough, Beetaloo, Energy Australia, Chevron, Rio Tinto, Glencore, Inpex, Gorgon and Browse. On the website it states that the largest climate polluting companies are contributing more to our national carbon emissions, hence the idea to name them. Much of the southeastern Australia is baking, just as it did in 2009 when over 400 people died in Victoria and South

Australia as a consequence of the heat. The news article states that Australia is increasing experiencing extreme heat and this results in more mortality than floods, storms, and bushfires combined [61]. The most economical and effective strategy is to address pollution that drives extreme heat with major fossil fuel polluters aware that their products heat our planet. The naming would serve to align causation with consequence. While this news article doesn't specifically elaborate on how extreme heat affects koalas per say, nor animals, the heating of our country and the discussion on this topic is what is important. These heatwaves can result in droughts increasing in duration and intensity, forest fires and smoke, energy depletion and agricultural devastation [48].

### 8. Hilton's photographic repertoire / repository of free photographs available for usage specific to endangered Australian animals

S. Hilton has a flickr site and on the site, there is an album titled 'animals' [63]. There are two koala photographs, plus photographs of other Australian animals including seals and a kangaroo. There is also a bird album in addition to some bird and crocodile photographs pictured in the album titled 'top end trip 2025'. In terms of which animals are endangered that are pictured in these albums, the koala is one marsupial as such.

During the 2019/2020 Australian megafires, the topic of Koalas (*Phascolarctos cinereus*) welfare being comprised was evident, generating emotions worldwide. In 2022, the koala was listed as 'Endangered' in Queensland, New South Wales, and the Australian Capital Territory [64]. Climate events including climate change, along with environmental destruction and disease can contribute to species decline. After the meta-fires, the Koala Genome Survey, an open data resource was created and koala genomes are on this Amazon Web Services platform. This aids to educate in the area of conservation planning now and in future years.

Organisations may utilize photographs such as these on this flickr site to make people aware of endangered species [63]. These photographs are available for download and usage is allowable, but correct and polite acknowledgement of the source and photographer is necessary. These photographs if utilised must be displayed with acknowledgement [Photograph taken by Stephen Hilton - Photography Flickr Website; <https://www.flickr.com/photos/stephenjhilton/>] [63]. In the words of HRH Prince William, Founder and President, of The Earthshot Prize [30]. "The Earthshot Prize exists to champion the game-changers, the makers, the creatives, the leaders. When they win, we all win."

This powerful statement also has relevance to this Australian example of protecting endangered koalas. The superb photographs on the flickr site have potential to influence and guide people in the community and government to be more mindful of these endangered species [63]. We don't want to be guilty of shoving, pushing and knocking koalas off tree branches and letting them drop heavily onto dirt or rocks as we hastily tree lop in order to build our new apartment building or complex in the Australian outback. That is false economy to build something nice while at the same time destroying something valuable. Unfortunately, some people or organizations globally don't consider what they destroy in the process of what they are trying to create. Often also we feel powerless to change this from happening, in that sometimes we feel like we don't have a voice. Let's use common sense in our

initiatives and strive towards achieving the WWF Goal which is to double koala numbers by 2050 through habitat restoration [13].

### 9. Author Contributions

D. Hilton conceptualized and wrote the original draft preparation, then edited and finalized the final version.

### 10. Funding

There is no funding, the writing is a voluntary task.

### 11. Institutional Review Board Statement

Not required as no interventional study was performed.

### 12. Informed Consent Statement

Not required.

### 13. Data Availability Statement

No data set was included.

### 14. Acknowledgments

Stephen Hilton Amateur Photography Flickr Website. Available from: <https://www.flickr.com/photos/stephenjhilton/> (cited 5th Feb 2026).

### 15. Conflicts of Interest

The author declares no conflict of interest.

### 16. References

1. Pubmed MESH [<https://www.ncbi.nlm.nih.gov/mesh/>]
2. Mukul SA, Alamgir M, Sohel Md SI, Pert PL, Herbohn J, Turton SM, *et al.* Combined effects of climate change and sea-level rise project dramatic habitat loss of the globally endangered Bengal tiger in the Bangladesh Sundarbans. *Science of The Total Environment*. 2019; 663:830-840.
3. Karmacharya D, Sherchan AM, Dulal S, Manandhar P, Manandhar S, Joshi J, *et al.* Species, sex and geo-location identification of seized tiger (*Panthera tigris tigris*) parts in Nepal-A molecular forensic approach. *PLoS One*. 2018; 13(8):e0201639. Doi: 10.1371/journal.pone.0201639
4. Martins APB, Feitosa LM, Lessa RP, Almeida ZS, Heupel M, Silva WM, *et al.* Analysis of the supply chain and conservation status of sharks (Elasmobranchii: Superorder Selachimorpha) based on fisher knowledge. *PLoS One*. 2018; 13(3):e0193969. Doi: 10.1371/journal.pone.0193969. 1, A.; Author 2, B., Year. Book Title, 3rd ed. Publisher: Publisher Location, Country. pp. page range.
5. Regan TJ, Taylor BL, Thompson GG, *et al.* Testing decision rules for categorizing species' extinction risk to help develop quantitative listing criteria for the U.S. Endangered Species Act. *Conserv Biol*. 2013; 27(4):821-831. Doi: 10.1111/cobi.12055
6. Brodie JF, Mohd-Azlan J, Chen C, Wearn OR, Deith MCM, Ball JGC, *et al.* Landscape-scale benefits of protected areas for tropical biodiversity. *Nature*. 2023; 620(7975):807-812. Doi: 10.1038/s41586-023-06410-z
7. Lindenmayer DB, Laurance WF. The ecology, distribution, conservation and management of large old trees. *Biol Rev Camb Philos Soc*. 2017; 92(3):1434-1458. Doi: 10.1111/brv.12290

8. Edwards DP, Gilroy JJ, Woodcock P, Edwards FA, Larsen TH, Andrews DJ, *et al.* Land-sharing versus land-sparing logging: Reconciling timber extraction with biodiversity conservation. *Glob Chang Biol.* 2014; 20(1):183-191. Doi: 10.1111/gcb.12353
9. Woinarski JC, Garnett ST, Legge SM, Lindenmayer DB, The contribution of policy, law, management, research, and advocacy failings to the recent extinctions of three Australian vertebrate species. *Conserv Biol.* 2017; 31(1):13-23. Doi: 10.1111/cobi.12852
10. Lynch TP, Harcourt R, Edgar G, Barrett N. Conservation of the critically endangered eastern Australian population of the grey nurse shark (*Carcharias taurus*) through cross-jurisdictional management of a network of marine-protected areas. *Environ Manage.* 2013; 52(6):1341-1354. Doi: 10.1007/s00267-013-0174-x
11. McConville A, Law BS, Mahony MJ. Are regional habitat models useful at a local-scale? A case study of threatened and common insectivorous bats in South-Eastern Australia. *PLoS One.* 2013; 8(8):e72420. Doi: 10.1371/journal.pone.0072420
12. Dickens R. The koala (*Phascolarctos cinereus*) past, present and future. *Aust Vet J.* 1975; 51:459-463. Doi: <https://doi.org/10.1111/j.1751-0813.1975.tb02379.x>
13. World Wildlife Fund Australia. Available from: <https://wwf.org.au/what-we-do/species/koala/> (cited 2026 Feb 5th)
14. Robinson KW. Heat tolerances of Australian monotremes and marsupials. *Aust J Biol Sci.* 1954; 7:348-360. Doi: <https://doi.org/10.1071/BI9540348>
15. Ellis W, Melzer A, Clifton I, Carrick F. Climate change and the koala *Phascolarctos cinereus*: Water and energy. *Aust Zool.* 2010; 35:369-377. Doi: <https://doi.org/10.7882/AZ.2010.025>
16. Law BS, Brassil T, Gonsalves L, Roe P, Truskinger A, McConville A. Passive acoustics and sound recognition provide new insights on status and resilience of an iconic endangered marsupial (koala *Phascolarctos cinereus*) to timber harvesting. *PLoS One.* 2018; 13(10):e0205075. Doi: 10.1371/journal.pone.0205075
17. Reckless HJ, Murray M, Crowther MS. A review of climatic change as a determinant of the viability of koala populations. *Wildl Res.* 2017; 44:458. Doi: <https://doi.org/10.1071/WR16163>
18. Adams-Hosking C, Grantham HS, Rhodes JR, McAlpine C, Moss PT. Modelling climate-change-induced shifts in the distribution of the koala. *Wildl Res.* 2011; 38:122.
19. Adam D, Johnston S, Beard L, Nicholson V, Lisle A, Gaughan J, *et al.* Surgical implantation of temperature-sensitive transmitters and data-loggers to record body temperature in koalas (*Phascolarctos cinereus*). *Aust Vet J.* 2016; 94:42-47. Doi: <https://doi.org/10.1111/avj.12393>
20. Adam D, Johnston SD, Beard L, Nicolson V, Gaughan JB, Lisle AT, *et al.* Body temperature of free-ranging koalas (*Phascolarctos cinereus*) in south-east Queensland. *Int J Biometeorol.* 2020; 64:1305-1318. Doi: <https://doi.org/10.1007/s00484-020-01907-y>
21. Phillips S, Wallis K, Lane A. Quantifying the impacts of bushfire on populations of wild koalas (*Phascolarctos cinereus*): Insights from the 2019/20 fire season. *Ecol Manage Restor.* 2021; 22:80-88.
22. Alerby E. A Picture Tells More than a Thousand Words. In: Brown, J., Johnson, N.F. (eds) *Children's Images of Identity. Transgressions: Cultural Studies and Education.* Springer, Rotterdam. 2015; 107. Doi: [https://doi.org/10.1007/978-94-6300-124-3\\_2](https://doi.org/10.1007/978-94-6300-124-3_2)
23. Alerby E. A way of visualising children's and young people's thoughts about the environment: A study of drawings. *Environmental Education Research.* 2000; 6(3):205-222.
24. Luttrell W. A camera is a big responsibility: A lens for analyzing children's visual voices. *Visual Studies.* 2010; 25(3):224-236.
25. Yates L. The story they want to tell, and the visual story as evidence: Young people, research authority and research purposes in the education and health domains. *Visual Studies.* 2010; 25(3):280-291.
26. National Portrait Gallery - Hold Still. Available from: <https://www.npg.org.uk/hold-still/> (2026 Feb 5th)
27. Bagge-Petersen C, Raju E, Nuhu S, Mtwangi-Limbumba T, Masao CA, Skovdal M. Photovoice: A Promising Method for Capturing and Responding to Climate Change? *WIREs Clim Change.* 2025; 16:e70009. Doi: <https://doi.org/10.1002/wcc.70009>
28. Mortensen S, Questiaux F, Vorburger J, Barber S, Faxon HO. Visualizing nature: A review of photovoice as a method for understanding environmental change. *Environmental Science & Policy.* 2026; 175:104298.
29. Entwistle A, Murphy J. Earthshot prize targets game-changing initiatives. *Oryx.* 2021; 55(2):169-170. Doi: 10.1017/S0030605320001362
30. The Earthshot Prize. Available from: [<https://earthshotprize.org/>] (cited 2026 Feb 5th)
31. Hilton D. An International Award-Winning Photograph Illustrates How Graphics Convey Climate Change Communication Messages. *Journal of Health and Social Sciences.* 2020; 5(4):449-456.
32. Hilton D. An Unhelmeted Motorcyclist Not Holding Both Handlebars - A Photographic Idea for Education Presented as an Initial Scoping Study. *Shanlax International Journal of Arts, Science and Humanities.* 2021; 9(1):1-7.
33. Hilton D. Let's Shine a Light on Water Safety in Australia. *Himalayan Journal of Community Medicine and Public Health.* 2022; 3:86-92.
34. Hilton D. A Digitally Enhanced Photograph Titled 'Laughter Tablets - Effective Misery Relief' - An Environmentally Sustainable Health Promotion Initiative. *Knowex Social Sciences.* 2023; 3(1):17-23.
35. Hilton DJ. Re-enforcing Cyclist Speed Restrictions on Shared Pedestrian Pathways Utilizing a New Creative Street Photographic Initiative. *Shanlax International Journal of Arts, Science and Humanities.* 2025; 13(2):51-57.
36. Hilton DJ, Hossain S, Chandra N. A survey evaluating a creative photographic initiative of rock jumping with potential hazards including a youtube creation for global reach. *Paripex Indian J of Research.* 2025; 14(4).
37. APACPH Early Career Network - Photographic Competition - Asia-Pacific Academic Consortium for Public Health. Available from: <https://www.apacph.org/wp/2019/11/apacph-early-career-network-photographic-competition/> (cited 2026 Feb 5th).
38. International Safety Media Awards (ISMA). ISMA

- Awards. Available from: <https://isma-awards.org/> (cited 2026 Feb 5th).
39. World Federation of Public Health Associations' (WFPHA) - Global Public Health Week (GPHW) Available from: <https://www.wfpha.org/global-public-health-week/> (cited 2026 Feb 5th).
  40. Photography website. Available from: [https://sites.google.com/d/1R505XcBbgh9Lr1LaE0teTaV62MgIHqgg/p/1vOF2kZP019gLFavI\\_CIF3D5HiGH7mTBZ/edit](https://sites.google.com/d/1R505XcBbgh9Lr1LaE0teTaV62MgIHqgg/p/1vOF2kZP019gLFavI_CIF3D5HiGH7mTBZ/edit) (cited 2026 Feb 5th).
  41. Ward M, Ashman K, Lindenmayer D, Legge S, Kindler G, *et al.* The impacts of contemporary logging after 250 years of deforestation and degradation on forest-dependent threatened species, 2023. Available from: [https://www.researchgate.net/publication/368761211\\_The\\_impacts\\_of\\_contemporary\\_logging\\_after\\_250\\_years\\_of\\_deforestation\\_and\\_degradation\\_on\\_forest-dependent\\_threatened\\_species](https://www.researchgate.net/publication/368761211_The_impacts_of_contemporary_logging_after_250_years_of_deforestation_and_degradation_on_forest-dependent_threatened_species), DOI: 10.1101/2023.02.22.529603. LicenseCC BY-NC-ND 4.0 (cited 2026 Feb 5th).
  42. Mella VSA, Cooper CE, Karr M, Krockenberger A, Madani G, Webb EB, *et al.* Hot climate, hot koalas: The role of weather, behaviour and disease on thermoregulation. *Conserv Physiol*, May 27, 2024; 12(1):coae032. Doi: 10.1093/conphys/coae032
  43. Hilton DJ. A literature review on COVID-19 [coronavirus] research specific to Australia including manuscripts on policy and media releases. *Journal of Evidence-Based Healthcare*, 2022; 4:e3846. Doi: <https://doi.org/10.17267/2675-021Xevidence.2022.e3846>  
<https://www5.bahiana.edu.br/index.php/evidence>
  44. Cormack M, Boxall AM, Hullick C, Booth M, Gruen RL. A purple patch for evidence-based health policy? *Aust Health Rev*. 2021; 45(1):74-76.
  45. Hilton DJ. Sars-Cov-2/Covid-19 [Coronavirus] Global Scientific Research and how it Impacts Workplace Health Management and Health Services, Including Policy Implications. *Irish Interdisciplinary Journal of Science & Research*. 2022; 6(3):38-43. Doi: <https://doi.org/10.46759/IJRSR.2022.6308>
  46. Gupta S, Carmichael C, Simpson C, Clarke MJ, Allen C, Gao Y, *et al.* Electric fans for reducing adverse health impacts in heatwaves. *Cochrane Database of Systematic Reviews*. 2012; 7. Art. No: CD009888. Doi: 10.1002/14651858.CD009888.pub2. Accessed 13 February 2026.
  47. Abunyewah M, Gajendran T, Erdiaw-Kwasie MO, Baah C, Okyere SA, Kankanamge AKSU. The multidimensional impacts of heatwaves on human ecosystems: A systematic literature review and future research direction. *Environmental Science & Policy*. 2025; 165:104024.
  48. De Paula Corrêa M. Heatwaves, biodiversity and health in times of climate change. *J Pediatr (Rio J)*, Mar-Apr 2025; 101 Suppl 1(Suppl 1):S27-S33.
  49. The University of Western Australia. Climate change driving marine heatwaves, impacting biodiversity. Available from: <https://www.uwa.edu.au/news/article/2025/july/climate-change-driving-marine-heatwaves-and-impacting-biodiversity> 16/07/2025. (cited 2026 Feb 14th).
  50. Palandri C, Frank EG, Ayal Kimhi, Lavon Y, Ezra E, Fishman R. High-frequency data reveal limits of adaptation to heat in animal agriculture. *Science Advances*. 2025; 4;11(27).
  51. Ecological Society of Australia. 6<sup>th</sup> Dec 2020. The impacts of heatwaves on Australia's wildlife. Accessed from: <https://www.ecolsoc.org.au/> (cited 2026 Feb 14th).
  52. Ashe B, McAneney KJ, Pitman AJ. Total cost of fire in Australia. *Journal of Risk Research*. 2009; 12(2):121-136. Doi: <https://doi.org/10.1080/13669870802648528>
  53. Woodruff RE, McMichael T, Butler C, Hales S. Action on climate change: The health risks of procrastinating. *Aust N Z J Public Health*. 2006; 30(6):567-571. Doi: 10.1111/j.1467-842x.2006.tb00788.x
  54. The Australian Government. Australian Climate Service. 2025. Built environment. Available from: <https://www.acs.gov.au/pages/environment-built> (cited 2026 Feb 5th).
  55. Shellard M, Bishop J, Tulloch A. The University of Sydney. Sydney Environmental Institute, April 2025. From the outside in; buildings and biodiversity. (cited 2026 Feb 5th).
  56. McGregor G. Defining Heatwaves. In: *Heatwaves. Biometeorology*. 2024; vol 6. Springer, Cham. Doi: [https://doi.org/10.1007/978-3-031-69906-1\\_2](https://doi.org/10.1007/978-3-031-69906-1_2)
  57. Shan L, Wang N, Duan F, Zhang S, Duan L, Zhang Q, *et al.* Global heatwaves: A scoping review on the trend, characteristics, impacts on air pollution and health. *Environmental Research*. 2025; 286:122976.
  58. EuroHEAT: Improving Public Health Responses to Extreme weather/heat-waves: Summary for Policy-Makers World Health Organization. Regional Office for Europe, 2009. Disponível em <https://iris.who.int/handle/10665/107934> [Accessed 2024 Mar 19th].
  59. Crespi A, Terzi S, Cocuccioni S, Zebisch M, Berckmans J, Füssel H-M. Climate-related hazard indices for Europe. European Topic Centre on Climate Change impacts, Vulnerability and Adaptation. (ETC/CCA) Technical Paper 2020/1, 2020, p. 64. Doi: [https://doi.org/10.25424/cmcc/climate\\_related\\_hazard\\_indices\\_europe\\_2020](https://doi.org/10.25424/cmcc/climate_related_hazard_indices_europe_2020)
  60. Hilton DJ. An Australian CDC - Learning from a Literature Review of USA Publications. *Shanlax International Journal of Arts, Science and Humanities*. 2025; 13(1):14-23. Doi: <https://doi.org/10.34293/sijash.v13i1.8963>
  61. The News Daily. Jan 27, 2026. As temperatures continue to rise, it's time to name heatwaves for what they are. Australian Government Department of Health (Australia). Accessed from: <https://www.thenewdaily.com.au/opinion/2026/01/27/name-killer-heatwaves> (cited 2026 Feb 5th).
  62. Ryan M. Should heatwaves be named after fossil fuel companies? Accessed from: [[https://www.moniqueryan.com.au/heatwave\\_poll](https://www.moniqueryan.com.au/heatwave_poll)] (cited 2026 Feb 5th).
  63. Stephen Hilton Amateur Photography Flickr Website. Available from: <https://www.flickr.com/photos/stephenjhilton/> (cited 2026 Feb 5th).
  64. Hogg CJ, Silver L, McLennan EA, Belov K. Koala Genome Survey: An Open Data Resource to Improve Conservation Planning. *Genes (Basel)*. 2023; 14(3):546. Doi: 10.3390/genes14030546