



LEGISLATIVE COUNCIL
ENVIRONMENT AND PLANNING COMMITTEE

Inquiry: Inquiry into ecosystem decline in Victoria

Hearing Date: 26 August 2021

Question[s] taken on notice

Directed to: Mr Vic Jurskis, Howitt Society

1. Dr Ratnam Page no. 39

Question asked.

To provide any peer-reviewed research for your assertions—so potentially anything you have co-authored.

Response:

In answer to Dr. Ratnam's question, I provide the following list of relevant peer-reviewed publications, which I have authored or co-authored, in international scientific journals, conference proceedings and books. Please note that I have already provided the Committee with an answer to the Member's implied question in her statement about weight of opinion, to which I had no real opportunity to respond during the hearing.

In providing this list, I would like to remind the Committee of the importance of "re" in the term research. The Howitt Society Submission does not rely exclusively or even mainly upon my own personal publications. My research builds on that of others. Please note that the list of key references in our submission contains 8 citations of peer-reviewed scientific papers in journals/proceedings, from which I'm an author of 4. I'm also an author of 4 out of 26 other peer-reviewed journal articles cited in the submission. To use a sporting analogy, healthy scientific debate must focus on the ball rather than the player.

Out of roughly 400 bibliographic entries in my book on Firestick Ecology, about 40% are peer-reviewed articles by other authors from scientific journals. There are many other peer-reviewed articles from historical journals as well as original historical records. On top of that are many other citations from scientific literature in various books.

I've attached copies of 8 key references indicated by asterisks and have also included a link to one key paper. I will be happy to supply copies of any others on request from the Committee.

*Bi, H., Jurskis, V., Cai, S., 2001 Models for multiple use management of regrowth forests in southeast New South Wales, Australia. In: Proceedings of **IUFRO conference** on Forest Modelling for Ecosystem Management, Forest Certification, and Sustainable Management, August 12-18, 2001, **University of British Columbia, Vancouver, Canada.**

Jurskis V. 2000 Vegetation changes since European settlement of Australia: an attempt to clear up some burning issues. **Australian Forestry** 63, 166-73.

Jurskis, V. 2002 Restoring the prepastoral condition. *Austral Ecology* 27, 689-90.



- Jurskis, V. 2004a Foraging preference of the smoky mouse, *Pseudomys fumeus*, in south-eastern New South Wales: an examination of sampling strategies. **Australian Forestry** 67, 149-51.
- Jurskis V. 2004b Does logging favour bellbirds and promote tree decline? **Australian Forestry** 67, 274-6.
- *Jurskis, V. 2005a Eucalypt decline in Australia, and a general concept of tree decline and dieback. **Forest Ecology and Management** 215, 1-20.
- Jurskis V. 2005b Decline of eucalypt forests as a consequence of unnatural fire regimes. **Australian Forestry**, 68, 257-62.
- Jurskis, V. 2008. Drought as a factor in tree declines and diebacks. In *Droughts: Causes, Effects and Predictions*. Ed. J.M. Sanchez. **Nova Science Publishers Inc., New York**. pp. 331-41.
- Jurskis, V. 2009 River red gum and white cypress forests in south-western New South Wales, Australia: ecological history and implications for conservation of grassy woodlands. **Forest Ecology and Management** 258, 2593-601.
- *Jurskis, V. 2011a Benchmarks of fallen timber and man's role in nature: some evidence from temperate eucalypt woodlands in southeastern Australia. **Forest Ecology and Management** 261, 2149-56.
- *Jurskis, V. 2011b Human fire maintains a balance of nature. In *Proceedings of Bushfire CRC & AFAC 2011 Conference, Science Day*. 1 September 2011, **Sydney Australia**. Ed. R.P. Thorton. Bushfire Cooperative Research Centre, Melbourne, Australia. pp. 129-38.
<http://www.bushfirecrc.com/resources/pages-129-138-human-fire-maintains-balance-nature>
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- *Jurskis, V. 2017a Ecological history of the koala and implications for management. **Wildlife Research** 44, 471-83. doi.org/10.1071/WR17032
- Jurskis, V. 2017b Mooted extinction of koalas at Eden: improving the information base. **Wildlife Research** 44, 449-52. doi.org/10.1071/WR16171
- Jurskis V. 2016 'Dieback' (chronic decline) of *Eucalyptus viminalis* on the Monaro is not new, unique or difficult to explain. **Australian Forestry** 79, 261-4.
- Jurskis, V. 2018 Mild burning, not apex predators, can restore dynamic stability in ecosystems: a response to Rees *et al.*. **Biological Conservation** 218, 287-8.
- *Jurskis, V., Bridges, B., de Mar, P. 2003 Fire management in Australia: the lessons of 200 years. In *Joint Australia and New Zealand Institute of Forestry Conference Proceedings* 27 April – 1 May 2003. Eds. E.G. Mason C.J. Perley. Ministry of Agriculture and Forestry, **Wellington, New Zealand**. pp. 353-68.
- Jurskis, V., Burrows, N., Underwood, R. 2021 A comment on Wilson, Bradstock & Bedward – Forest ecology and management 481 (2021) 118701: "addressing carbon stock risk mitigation". **Forest Ecology and Management** 481, 11 87 01.
- Jurskis V., de Mar P. 2005 Monitoring the health of native forests: how difficult is it? **The International Forestry Review** 75, 196.



- Jurskis, V., Douch, A., McCray, K., Shields, J. 2001 A playback survey of the koala, *Phascolarctos cinereus*, and a review of its distribution in the Eden region of south-eastern New South Wales. **Australian Forestry** 64, 226-31. doi:10.1080/00049158.2001.10676193
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- Jurskis, V., Turner J. 2002 Eucalypt dieback in eastern Australia: a simple model. **Australian Forestry** 65, 81-92.
- Jurskis, V., Turner, R.J., Jurskis, D. 2005 Mistletoes increasing in 'undisturbed' forest: a symptom of forest decline caused by unnatural exclusion of fire? **Australian Forestry** 68, 221-6.
- Jurskis V., Turner J., Lambert M. 2006 Forest decline: should we manage or muddle? **Australian Forestry** 69, 314-5.
- *Jurskis, V., Turner, J., Lambert, M., Bi, H. 2011 Fire and N cycling: getting the perspective right. **Applied Vegetation Science** 14, 433-4.
- Jurskis V., Underwood R. 2012 Fire frequency in south-eastern Tasmania. **Australian Forestry** 75: 65–66.
- Jurskis, V., Underwood, R. 2013 Human fires and wildfires on Sydney sandstones: History informs fire management. **Fire Ecology** 9, 8-24.
- *Jurskis, V., Underwood, R., Burrows, N. 2020 How Australian Aborigines Shaped and Maintained Fire Regimes and the Biota. **Ecology and Evolutionary Biology**
<http://www.sciencepublishinggroup.com/journal/paperinfo?journalid=231&doi=10.11648/j.eeb.20200504.17>
- *Turner, J., Lambert, M., Jurskis, V., Bi, H. 2008 Long term accumulation of nitrogen in soils of dry mixed eucalypt forest in the absence of fire. **Forest Ecology and Management** 256, 1133-42.

2. Ms Bath – additional question received by email

Question asked.

Are Koalas in Victoria threatened? Or anywhere else in their natural range?

Response:

No. There are many more koalas across a much wider range than there were at the time that Europeans occupied Australia. Koalas are an irruptive species. Were they not so cute, they would be recognized as a pest along with a wide range of other native species of plants and animals which increased after Europeans or their diseases disrupted Aboriginal burning. I've appended a koala population timeline for the information of the Committee.

None of the 'identified threats' to the persistence of wild koalas are real:

Clearing

Koalas were naturally restricted to forests on rougher country which have mostly been unaffected by clearing and have almost universally increased in density since European arrival. Koalas expanded into woodlands after initial European agricultural development and recent tree plantings for timber or amenity.



Climate Change

Natural low-density populations have been unaffected by any of the numerous severe droughts and heatwaves from the time of European arrival to the present day. Most irrupting populations continued to increase during the Millennium and Black Summer Droughts. A few very high-density populations crashed back to natural levels, notably in the NSW Pilliga Scrub and QLD's Koala Coast.

Disease

Disease is a consequence of nutritional stress in unsustainably dense populations. Most low-density populations have Chlamydia but not Chlamydiosis.

Logging

Scientific studies in the late 20th Century showed that koalas given a choice, preferentially occupied trees in recently logged areas rather than unlogged areas. This was a response to fresh growth in trees released from competition. Studies on NSW north coast showed that koalas were 3 times more common in dense young logging regrowth or plantations than in unlogged forest. By 2018, with all forests declining from lack of mild burning, koalas were irrupting throughout the landscape. Surveys using reliable methods for detecting koalas in low densities found five times as many koalas as previously thought. Soft young growth from the Black Summer fires is already boosting population growth.

Loss of genetic diversity

Contrary to assertions by Victorian bureaucrats, translocations have had no impacts on genetic diversity of koalas. The diversity in the supposed source sub-population in South Gippsland is no different to that in the supposedly reintroduced sub-population at Cape Otway. It is less than in the introduced population on St. Bees Island in Queensland.

Reference:

Kjeldsen, S.R., Zenger, K.R., Leigh, K., Ellis, W., Tobey, J., Phalen, D., Melzer, A., FitzGibbon, S., Raadsma, H.W., 2016 Genome-wide SNP loci reveal novel insights into koala (*Phascolarctos cinereus*) population variability across its range. *Conservation Genetics* 17, 337-53.

Predation

Feral and/or native predators respond to the increased food supply provided by irrupting koala populations. Dingoes irrupted in response to 19th century koala irruptions in the Strzeleckis. Foxes irrupted after early 20th century koala irruptions in The Pilliga. On the Koala Coast, wild dogs and carpet snakes irrupted with koala plagues early in the new millennium.

Road Accidents

Proliferation of road signs warning of koalas is a recent development consequent to increasing and expanding koala populations. Deer warning signs are proliferating for similar reasons. 'Researchers' and NGOs in the lucrative koala industry claim that development is encroaching on prime koala habitats. In fact both native and feral species are invading new habitats to take advantage of



increased browse created by post-European mismanagement of native vegetation. The same browse fuels megafires.

Koala Population Timeline

1788 Europeans arrive at Weerong/Sydney Cove

1791-1815 Numerous expeditions go to the Blue Mountains and beyond. No koalas are sighted

1798 An ex-convict who'd lived for a while with Aborigines, shows explorer John Price some koala dung south of the Cumberland Plain

1802 Barallier's guide Gory barter two spears and a tomahawk for a sample of two koala feet, south of the Cumberland Plain. Europeans employ Aborigines to search for koalas

1803 A live koala is brought into Sydney from south of Cumberland Plain. The Gazette reports: *"its food consists solely of gum leaves, in the choice of which it is excessively nice"*

1810 The first published drawing notes that the koala is *"a solitary animal rarely to be met with"*

1815 Evans reports extensive Aboriginal burning in the Blue Mountains

1817-1846 Oxley's, Sturt's, and Mitchell's parties conduct many extensive explorations throughout what we now know to be the koala's natural range. No koalas are sighted.

1818 An Aborigine guiding naturalist Allan Cunningham in the Illawarra kills a koala

1821 Hume's party is told by local Aborigines of koalas in scrub on the upper Shoalhaven River

1830s Europeans occupy grassy woodlands in coastal valleys of NSW and VIC, and sow pastures. No koalas are sighted. Aboriginal burning is disrupted right around the coastal side of the Great Dividing Range

1836 Surveyor Govett (back in England) writes of plentiful koalas seen in dense young stringybark forests which sprang up in the foothills on both sides of the Blue Mountains, and of a new Aboriginal technique to drag them out of trees with a bark noose and pole

1840 Strzelecki becomes the only explorer ever to see koalas. His party eats them to survive as they struggle through dense 20-year-old forest initiated by our first megafire in what are now known as the Strzelecki Ranges

1844 Gould searches for koalas near Sydney (Govett and Strzelecki have both left Australia). Even with Aboriginal guides, they *"could rarely be detected"* except by *"diligent"* search and only



in thick scrub on the rough escarpments of the Illawarra and the Liverpool Ranges. Gould predicts their extinction.

1851 Within a few decades of general disruption of Aboriginal burning, the Black Thursday Fires incinerate 5 million hectares of Victoria, including the Strzelecki Ranges

1860s Koalas irrupting in thickening forests disperse through woodlands to eat soft young shoots resprouting in declining trees. Historical reports come from the Cumberland Plain and the Bega Valley in NSW, and the Goulburn Valley and Gippsland Plains in VIC

1870s – 1910 Europeans clear and burn the Strzelecki Ranges for dairy farms. They find plagues of dingoes feeding on plagues of koalas

1887 Koala plagues irrupt in valley woodlands from southeastern SA to southeastern QLD. They suffer malnutrition and disease. A fur industry commences. Koalas continue to increase

1895 The Federation Drought commences in the south (it starts and finishes later in the north)

1898 Koalas are legally protected in Victoria

1903 Koalas are legally protected in NSW

1905-1910 Gum leaves frizzle, koala numbers crash. They disappear from coastal woodlands across southeastern Australia. Stable low-density populations persist unnoticed in forests.

1906 Koala hunting is regulated in QLD.

1920s Koalas irrupt in central and northeast QLD where pastoral development was delayed compared to further south. Koalas suffer malnutrition and disease.

1927 The last open season is declared on koalas in QLD

1927 – 1933 koalas continue to increase in central and northeast QLD

1933 – 1939 koalas crash back to naturally low densities in central and northeast QLD during a period of mostly below average rainfall

1934 Fred Lewis, Inspector of Fisheries and Game in VIC, writes that koalas are extinct in SA and NSW, and there are “*very few*” left in the Strzelecki Ranges. He says the species is doomed to extinction in mainland Australia.



- 1934** *The Victorian Naturalist* publishes a map indicating (incorrectly) that the koala's range has contracted to central and northeastern QLD, except for artificial island populations in VIC.
- 1949** A mail-out survey reveals that koalas have been sighted in 109 separate locations across NSW since the 1920s
- 1974** NSW National Parks and Wildlife Service (NPWS) is established
- 1975** NPWS conducts a mail-out survey which gathers reports of more koala sightings at more locations than reported from 1920 - 1949
- 1976** A meeting of 43 koala experts at Taronga Zoo unanimously agrees that koalas are in absolutely no danger of extinction
- 1977** Sydney water supply catchments, south of Cumberland Plain, burn in high intensity wildfires
- 1980** Logging and high intensity wildfires northeast of Bega create dense young forests
- 1980s** Prescribed burning in NSW forests is reduced as more National Parks and more environmental regulations are created
- 1986** Koalas begin to irrupt once more on southern edge of Cumberland Plain
- 1987** Another mailout by NPWS turns up even more reports of koala sightings at even more locations than reported from 1949-1975.
- 1990** NPWS compares koala sightings over 2 years from 1985 to 1987 against sightings over 60 years from the 1920s to 1984. They 'find' that koalas have disappeared from hundreds of areas and are mainly confined to the north coast. They host a *Koala Summit*, launching an anti-logging campaign to create more National Parks
- 1991** Scientific research finds that north coast koalas are concentrated in dense young regrowth forests established by heavy logging, and in eucalypt plantations. There are 3 times more koalas in young forests than in oldgrowth
- 1992** NSW lists koalas as vulnerable to extinction
- 1995** Regrowth forests and plantations near Coffs Harbour are locked up to 'save' koalas
- 1995** Koala populations and chronic eucalypt decline are increasing in north coast forests, whether young regrowth or oldgrowth



1997-2001 Koala populations and chronic eucalypt decline are increasing in dense young forests and oldgrowth forests northeast of Bega

1820 to Black Saturday 2009 Despite twenty megafires in the Strzeleckis over two centuries, and short rotation timber plantings and clearfellings since the 1940s, koalas are still there in high densities

2010 The Threatened Species Scientific Committee (TSSC) advises the Federal Environment Minister (wrongly) that there's obviously been a marked decline in the total koala population, and (rightly) that there's not enough data to show that it meets the criteria for listing as a threatened species

2010 NPWS claims that there's never been many koalas in the Blue Mountains. Koalas supposedly relied on the woodlands that have since been cleared for agriculture and urban development

2011 The Senate Environment Reference Committee reports that there were 10 million koalas when Europeans arrived and saw none. They recommend that the TSSC includes population data in future advices to the Minister, and that the Minister considers listing the koala as a vulnerable species in some areas

2011 November The TSSC revises its advice to the Minister on the basis of "*new information mostly arising from the Senate Inquiry*". TSSC recommends that the Minister designates QLD, NSW and ACT koalas as a species for the purposes of the EPBC Act, and lists them as vulnerable.

2012 February 17 koala experts gather in Brisbane to 'synthesise' population data

2012 April QLD, NSW, ACT koalas are listed under the EPBC Act as a vulnerable species

2013 High Intensity wildfires burn across Blue Mountains and to the south of Cumberland Plain

2014 NPWS makes a model 'showing' that koalas are extinct at Eden, except for a few survivors in a 'climate refuge' north-east of Bega

2016 Koala experts publish their 'synthesised' population data, boasting that they made it up: "*A quantitative, scientific method for deriving estimates of koala populations and trends was possible, in the absence of empirical data on abundances.*"

2016 NSW declares a new koala park to 'protect' an irrupting population north-east of Bega

2016 NSW Chief Scientist conducts an *Independent Review into the Decline of Koala Populations in Key Areas of NSW*, based on 4 case studies by NPWS/OEH. She finds that 3 irrupting populations at Campbelltown, Coffs Harbour and Eden are respectively: *stable or increasing*;



stable to slowly declining; significantly reduced to about 45 koalas. The unsustainably dense Liverpool Plains-Pilliga population which crashed in the Millennium Drought is said to have suffered a dramatic decline

- 2018** NSW releases a *Koala Strategy* which aims to “*stabilise and then increase koala numbers*”, mainly by creating 24,000 hectares of new koala parks
- 2018** NSW Department of Primary Industries (DPI) publishes scientific research showing that koala numbers are 5 times higher than previously thought on the north coast and are not affected in any way by logging
- 2018** DPI gets more funding to do more research about the non-existent impact of logging on koalas
- 2019** DPI publishes scientific research showing that koala numbers are much higher where only about 45 survivors are supposedly hanging on in a ‘climate refuge’ northeast of Bega than they are on the north coast where they are 5 times higher than previously thought
- 2019** NSW Parliament holds a Koala Inquiry.
- 2019** Lightning starts what will become the world’s largest ever wildfire from a single ignition, more than half a million hectares, in ‘protected’ koala habitat in the Blue Mountains wilderness
- 2019** During the megafire, a Director of Science for Wildlife tells the Inquiry that koalas started “*popping up*” during the 2013 fires. Now “*Everywhere we look we find a lot of koalas – a young and expanding population*”
- 2020** NSW Koala Inquiry finds that, given the loss of koalas in the Black Summer megafires, koalas will be extinct by 2050 unless there’s urgent government intervention to protect habitat
- 2021** ABC Catalyst reports that koalas with joeys just born when Black Summer megafires ripped through their habitat are in great condition and doing very well