

Fast-tracking extinction

Australia's national
environmental law



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Executive **summary**

Australia is one of the few mega-diverse places on earth. But sadly, like the world, we are in the grips of an extinction crisis.

Australia leads the world in mammal extinctions¹ and has seen three unique animals go extinct in the past decade alone. At no time in human history has global wildlife disappeared at a faster rate.²

If we are to address this crisis we need strong national leadership and national environmental laws that genuinely protect wildlife.

This means protecting wildlife from what is currently one of the biggest driver of species decline and extinction globally: habitat loss.³ In Australia, habitat destruction and degradation is the greatest threat to our native wildlife, closely followed by invasive pests like cats and foxes.

The loss and destruction of native bushland has serious implications for Australia's flora and fauna. The reality is that many animals are killed or maimed in the bulldozing of forest and woodland habitat.

Despite having national environmental laws that are intended to protect threatened species, analysis completed by the University of Queensland – in conjunction with the Australian Conservation Foundation, WWF Australia, and The Wilderness Society – has found that **since the EPBC Act has come into effect, approximately 7.6 million hectares of threatened species habitat has been destroyed due to bulldozing or logging.**

That's an area of threatened species habitat larger than the state of Tasmania destroyed in just 17 years.

What is more concerning is that only 0.78 million hectares – or 10% of the overall area lost – was mapped as occurring in areas assessed under the national environmental law, although that does not mean that the particular referral explained the losses observed.

The iconic koala has been hardest hit, with almost 1 million hectares of habitat destroyed since 2000.

Of this, 391,709 hectares was known habitat – the highest result for the loss of known habitat of all the threatened species.

These statistics tell a damning story. Despite high aspirations to protect biodiversity and threatened species, our national environmental law has fundamentally failed at addressing the most significant driver of extinction – the loss, destruction and fragmentation of forests and bushlands.

The analysis highlights that despite national protections, species such as the koala, red goshawk, greater glider, and yakka skink have suffered huge losses of habitat over the past 18 years. These losses are contributing significantly to the decline of populations and ultimately driving these species to extinction.

What is clear is the need for urgent interventions to genuinely protect threatened species. Australia needs a new generation of national environmental laws to effectively protect wildlife habitats and avert a tidal wave of extinctions.

An area of threatened species habitat **larger than the state of Tasmania has been destroyed in just 17 years.**

Why **extinction matters**

Australia is truly the lucky country. As a nation, we are one of the few mega-diverse places on earth that supports an incredible array of completely unique plants and animals.

Our extraordinary and celebrated species, from the koala through to the wollemi pine, have evolved isolated from the rest of the world over tens of millions of years. Australia is spoilt when it comes to wildlife, but sadly in modern Australia, our governments are failing to protect the plants and animals that make our nation so unique.

Australia has the highest number of mammals declared extinct since the arrival of Europeans, with 28 mammals formally declared extinct.⁴ This list is expected to grow later this year, with an additional nine mammals likely to be added to the extinct category.

Some of these species, such as the Capricorn rabbit rat and broad-cheeked hopping mouse, likely disappeared in the mid-20th century. However, Australia's faunal extinction record is not something of the distant past. Since 2009, three species of animal, the Bramble Cay melomys, the Christmas Island pipistrelle and Christmas Island skink have gone extinct. In fact, the extinction of native species is anticipated to be 1,000–10,000 higher than the natural level.⁵

Once a species is lost it can have ongoing ramifications for people and nature. Extinction is a confronting but important concept. There are cultural, scientific, ecological and moral impacts from the extinction of species.

It's a basic fact of life that wildlife needs space to survive and intact ecosystems are critical to the long-term persistence of wildlife. The destruction of areas essential for survival – such as breeding, foraging, movement, refuge and resting habitats – stops species breeding, increases death rates and leads to population crashes.

The loss of habitat also reduces the capacity of species to move through a landscape, isolating them into small pockets where they can suffer higher death rates and, in some instances, eventually die out. Habitat loss also reduces the places that species can seek refuge from other predators, from extreme weather, and from disease. Once bulldozed or logged, these places are normally lost forever.

There is no doubt that Australia is in an extinction crisis and that it is likely to accelerate as the pressures on our natural world continue to grow. Our current suite of laws, and the agencies trusted to enforce them, have failed in the task of solving this crisis. It is an outrageous fact that extinction is still legal in Australia despite international obligations and targets that direct us to avert all avoidable extinctions.

Australia has the highest number of mammals declared extinct since the arrival of Europeans, with 28 mammals formally declared extinct.

Australia's **national environmental law**

Australia's key piece of national wildlife protection law, the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), was enacted in 2000.

The law was intended to protect threatened species and their habitats to improve their conservation status. It created the national threatened species list as well as a set of processes for improving conservation outcomes through recovery and threat abatement planning.

The EPBC Act also established the process for national oversight and approval for any activity that may significantly impact or harm nationally threatened species. Since it has come into effect, more than 6,100 projects have been referred under the legislation. In that same time, the list of species and ecological communities threatened with extinction has grown by more than 30%, from 1,483 to 1,947. In fact, since the legislation began at least three animals are known to have gone extinct.

The law currently requires that any activity that would have a significant impact on threatened species and ecological communities be referred to the federal government for assessment – in effect a request for approval. The Australian government's own guidelines note that activities likely to have a significant impact include those which:

- lead to a long-term decrease in the size of a population
- reduce the area of occupancy of the species
- fragment an existing population into two or more populations
- adversely affect habitat critical to the survival of a species
- disrupt the breeding cycle of a population
- modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.⁶

This generally means that for most projects that destroy nationally threatened species habitat, referral to the federal government under national law is likely required. The federal government has successfully prosecuted the unauthorised

destruction of as little as half a hectare of a threatened ecological community or the destruction of eight hectares of black cockatoo habitat.⁷

Even though the EPBC Act has been in effect for more than 18 years, there remains little evidence of the effectiveness of the act in protecting threatened species habitats. In the legislation's history, out of more than 6,100 projects referred to the government for assessment, only 21 (less than 0.3%) have been refused.

Whilst habitat loss is one of the biggest threats to wildlife, to date the federal regulator responsible for implementing the EPBC Act has no mechanism for tracking or monitoring the state and trends of threatened species habitats.⁸

More scandalous still, as we show in this analysis, is the fact that the vast majority of destroyers of habitat do not even bother to refer and suffer no enforcement penalty for doing so. This is the first time analysis has been done to map the area of nationally listed threatened species habitat that has been destroyed since 2000 and not referred or assessed under the EPBC Act.

Threatened species habitat loss under the EPBC Act

Up to 7.47 million hectares of threatened species habitat – an area larger than the state of Tasmania or 3.7 million Melbourne Cricket Grounds – has been destroyed since the operation of the EPBC Act (from 2000-2017). This figure is on top of historic habitat destruction, which until 2000 had stripped Australia of more than 83 million hectares of forests, 13 million hectares of mallee, 2 million hectares of heath and 6 million hectares of grasslands since European settlement.⁹ Australia's record on deforestation and habitat destruction is not one we should be proud of.

Types of habitat loss

The 7.47 million hectares of habitat loss is made up of both known locations of threatened species populations as well as likely locations based on habitat suitability. The two categories are derived from government data for species distribution.¹⁰

Known habitats are generally areas of habitat at or near known locations of species. When overlaid with woodland and forest loss data it is estimated that approximately 1.19 million hectares of known threatened species habitat has been destroyed since the operation of the EPBC Act (Table 1).

Likely habitats are areas of preferred habitat that occur within a species' geographical distribution, and may be assessed using a modelling tool, such as Maxent. From 2000–2017, 7.44 million hectares of likely threatened species habitat has been destroyed since the operation of the EPBC Act (Table 1).

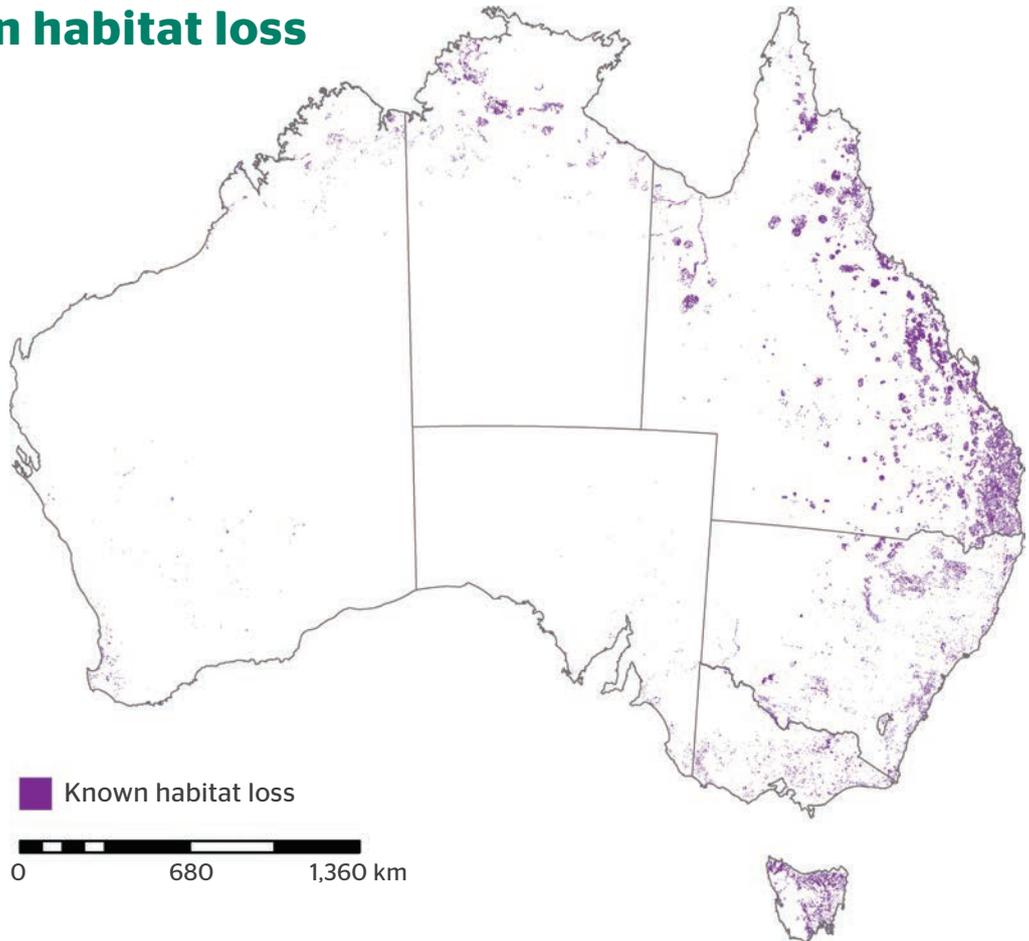
Since the EPBC Act came into operation, the Australian government has collected spatial data on location of developments for which referrals (applications for approval) have been made. These data vary significantly in accuracy and reliability. Since 2006 the collection of spatial data under the EPBC Act referral process has improved markedly. Nonetheless many referral footprints greatly exceed the actual surface development footprints.

Table 1:
Nationally threatened species habitat loss 2000–2017

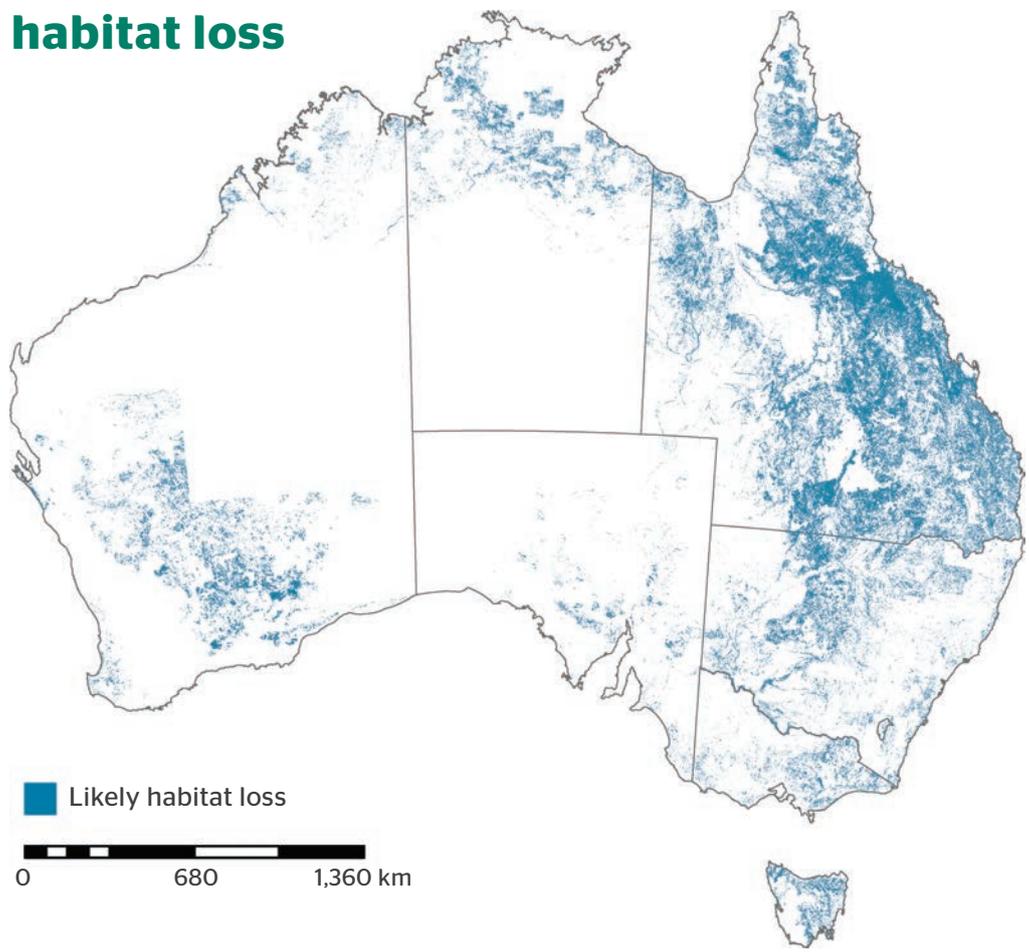
TYPES OF LOSS	LOSS OF LIKELY THREATENED SPECIES HABITAT (hectares)	LOSS OF KNOWN THREATENED SPECIES HABITAT (hectares)	TOTAL HABITAT LOSS (%)
Potentially regulated habitat loss under EPBC Act	786,462	274,048	10.53
Unregulated habitat loss under EPBC Act	6,660,938	922,695	89.47
Total habitat loss 2000–2017	7,447,400	1,196,743	
Total nationally threatened species habitat loss 2000–2017	7,473,237		



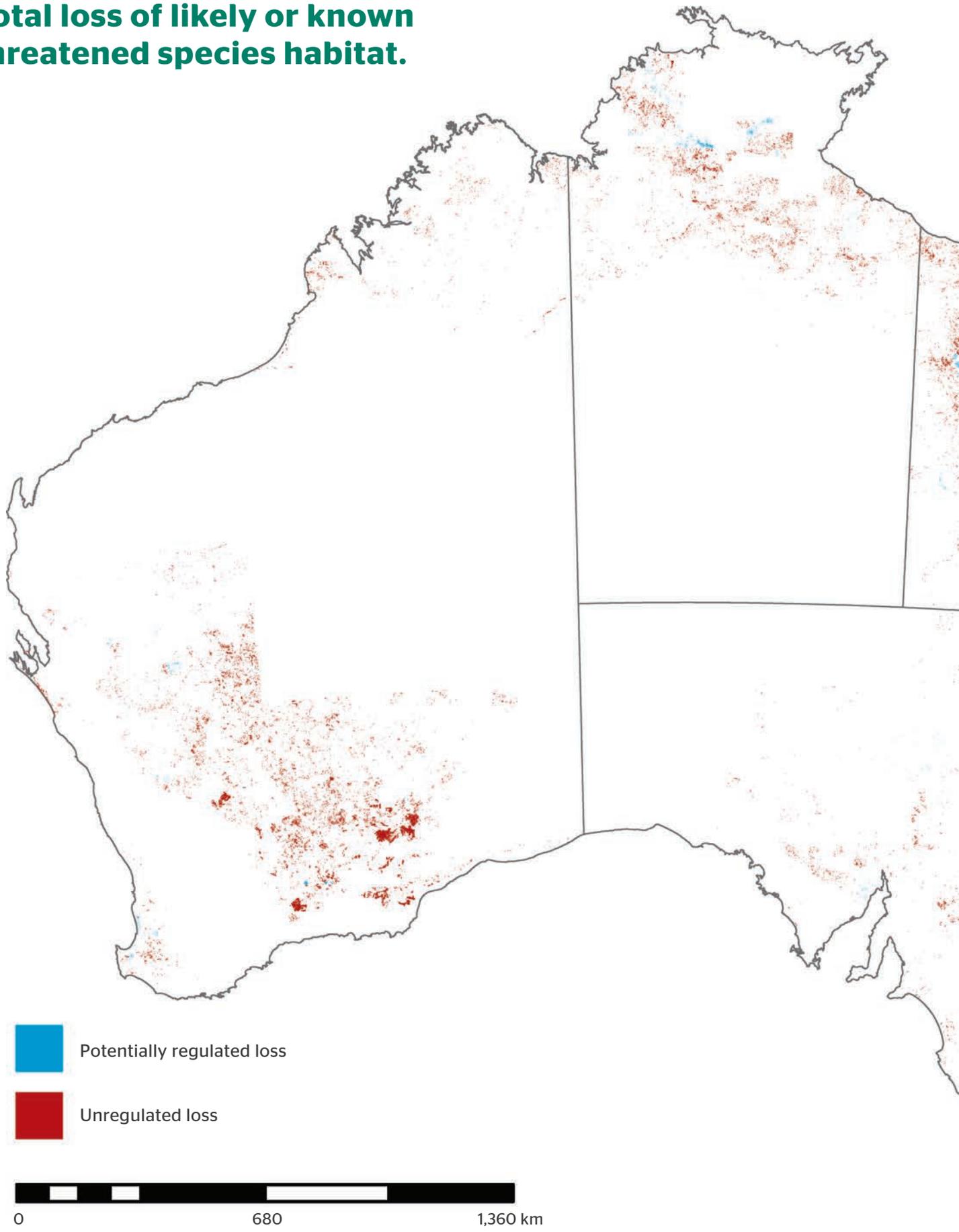
Known habitat loss

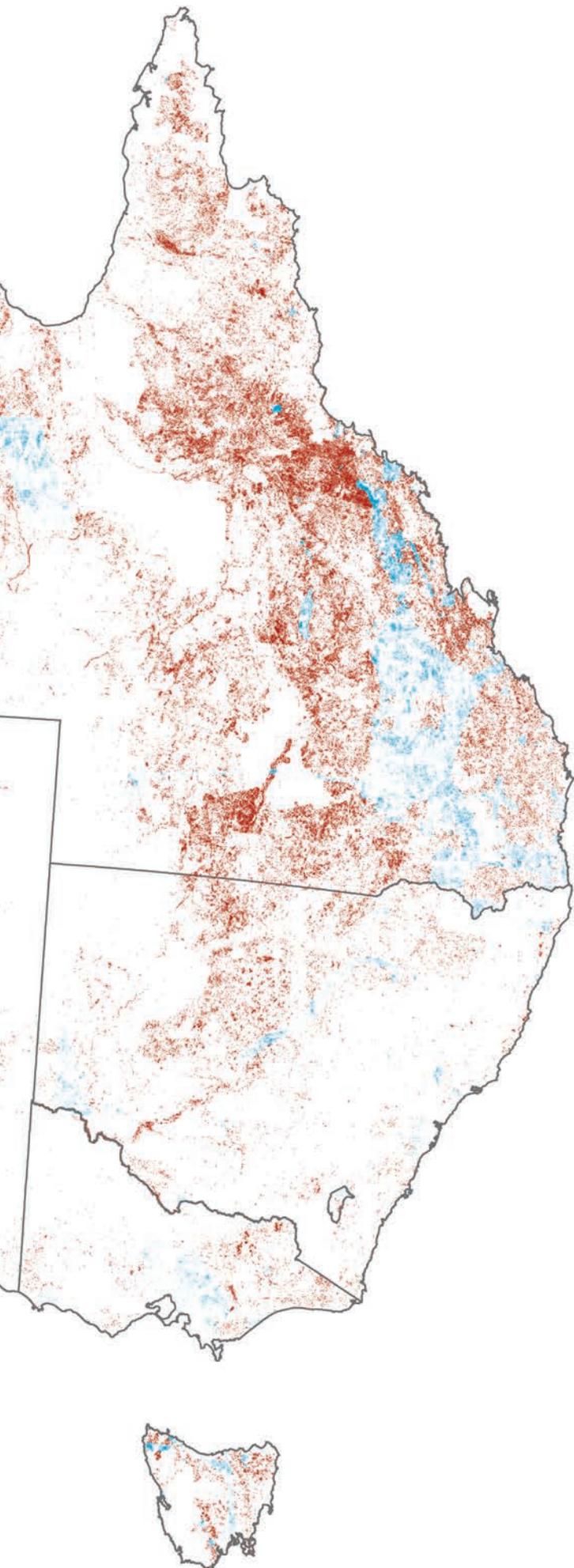


Likely habitat loss



Total loss of likely or known threatened species habitat.





The EPBC referrals data was used to analyse how much loss of threatened species habitat was potentially regulated by our national environmental law, which has been charged with protecting and restoring threatened species populations. The analysis highlights that, at most, only 787,044 hectares of threatened species habitat loss has occurred in an area referred for assessment under our national environmental law. This represents only 10% of the total estimated threatened species habitat loss that has occurred since the operation of the EPBC Act.

This means that at least 6.68 million hectares of destroyed threatened species habitat has never been assessed under national law. This demonstrates an abject failure of national environmental law to regulate the destruction of threatened species habitat.

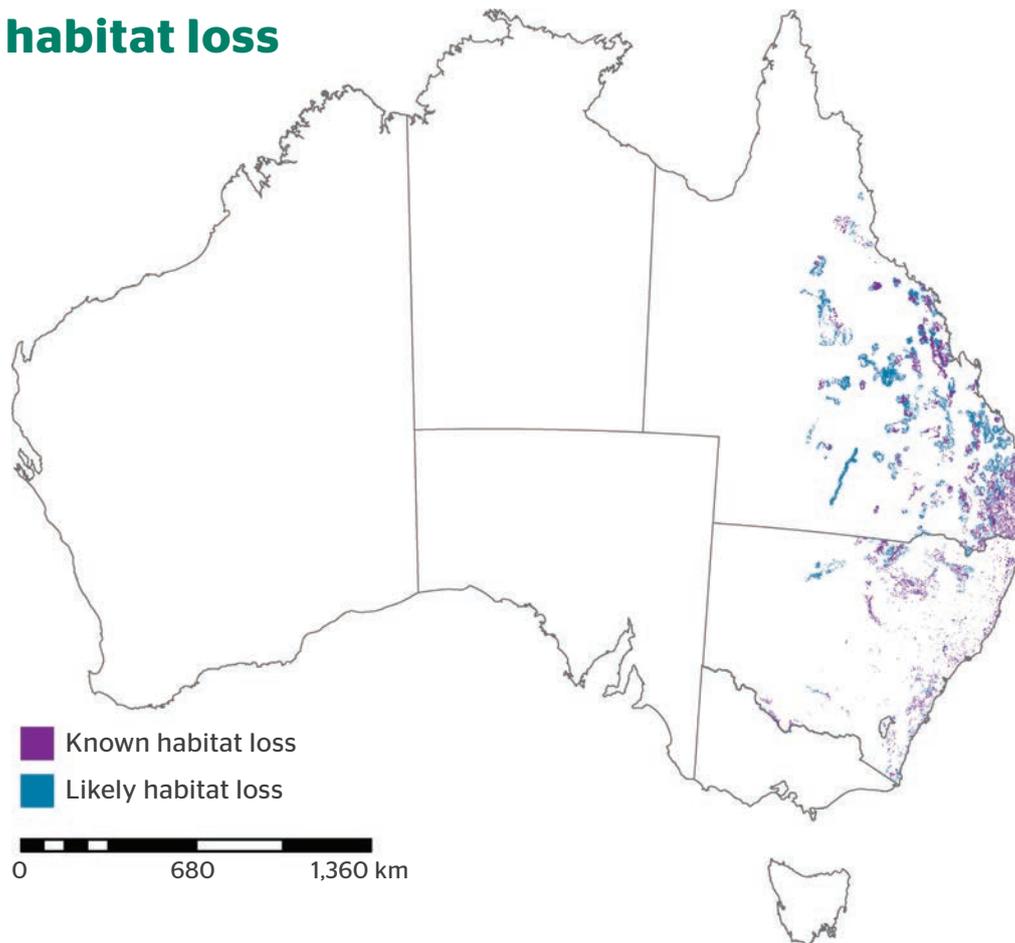
Further, this figure is likely to be a significant overestimate of the amount of habitat regulated under the EPBC Act. Whilst the actual figure of regulated habitat loss is likely to be much lower, it would involve close interrogation of the specific footprints and development activities of the more than 6,100 referrals under national environmental law.

Drivers of habitat loss

The loss of threatened species habitat across Australia over the past 18 years has been driven by a number of factors. This includes bulldozing for agriculture, native forest logging, urban development and mining. The most significant driver of bulldozing of forest and woodland over this period has been agriculture and especially livestock pasture.

Another cause of habitat and forest change has been fire, which is an integral part of many of Australia's ecosystems. We have masked out fire as a cause of forest and woodland loss to the extent possible. However, unnatural fire regimes, such as fires that burn unseasonably or too frequently, can degrade habitats and alter ecosystems, leading to species loss. To the extent this results from intentional human actions, burning can also be referred for approval. But for purposes of this analysis we have excluded referrals for prescribed burns, as well as forest and woodland loss due to burns. Prescribed burning of forests that are not adapted to fire also presents a modern challenge, particularly in wet sclerophyll forest of south-eastern Australia.

Koala habitat loss



This analysis demonstrates that our current national environmental law has clearly failed to stop the loss of habitats for threatened species over the course of its operation.

Impacts on selected species

The total habitat loss figure of 7.47 million hectares includes the loss of significant areas of habitat for iconic species such as the koala as well as less well known species such as the Gouldian finch, masked owl and grey-headed flying fox. A list of species that have suffered significant destruction of habitat is at Table 2.

The koala (vulnerable) has seen very significant destruction of habitat since 2000, with almost 1 million hectares lost in that period. Of this, 391,709 hectares was known habitat – the highest result for the loss of known habitat. The New South Wales and Queensland koala populations were listed federally a vulnerable species in 2012 due to ongoing threats of habitat destruction. Yet this had limited impact on habitat loss trajectories. It has been estimated that in Queensland alone 5,000 koala deaths occurred between 2012-2016, of which 94% could be attributed to bulldozing of forests and bushlands.¹¹

Squatter pigeons (vulnerable) are another species that have suffered significant losses of known habitat, with 174,991 hectares lost and 1.07 million hectares of likely habitat destroyed. The species can be elusive and prefers remnant woodland and forest habitat in central and coastal Queensland. The primary threats to the squatter pigeon include the loss and fragmentation of habitat due to bulldozing habitat for agricultural purposes, and the degradation of habitat by overgrazing.¹² New coal-mines in central Queensland also contribute to the decline of this species through the continued destruction and fragmentation of habitat.

Similar threats face the regent honeyeater (critically endangered), one of Australia's most imperilled birds. This species is only thought to number 400 in the wild, yet has lost 15,140 hectares of known habitat over the operation of the EPBC Act.

The loss of habitat through diversion of water and deforestation, primarily for agriculture and irrigated cropping, has also driven the decline of the Australasian bittern (endangered). The species has lost significant areas of habitat including 97,729 hectares of known habitat.

The greater glider (vulnerable) saw 195,069 hectares of likely habitat lost over the period 2000–2017. The vast majority of this loss occurred prior to the species being nationally listed as a vulnerable species in 2016.

The koala, bittern and greater glider all share some commonalities in that they have been added to the

national federal list since 2012. For all three species, habitat loss and degradation was a primary threat that led to their listing. If Australia is serious about protecting threatened species and reducing the number of species classified as threatened, it has to take strong, meaningful action to protect intact ecosystems and habitats.

Table 2:
Loss of habitat for selected species 2000–2017

SPECIES	STATUS	LIKELY HABITAT LOSS (hectares)	KNOWN HABITAT LOSS (hectares)	TOTAL HABITAT LOSS (hectares)
Koala	vulnerable	546,042	391,709	937,751
Cassowary	endangered	5,901	3,527	9,428
Carnaby's cockatoo	endangered	46,230	2,057	48,287
Grey-headed flying fox	vulnerable	166,417	154,830	321,247
Growling grass frog	vulnerable	188,878	5,084	193,962
Regent honeyeater	critically endangered	96,522	15,140	111,662
Greater glider	vulnerable	195,069	12,010	207,079
Spot-tailed quoll	endangered (Mainland), vulnerable (Tasmania), endangered (North QLD)	148,472	77,793	226,265
Painted honeyeater	vulnerable	1,241,302	42,584	1,283,886
Squatter pigeon	vulnerable	1,077,468	174,991	1,252,459
Australasian bittern	endangered	178,250	97,729	275,979
Red goshawk	vulnerable	3,081,906	82,394	3,164,300
Yakka skink	vulnerable	644,907	13,943	658,850
Ghost bat	vulnerable	3,063,932	0	3,063,932
Gouldian finch	endangered	267,504	121,897	389,401

Laws and institutions **needed to genuinely protect threatened species**

This analysis highlights that our national environmental law has clearly failed to protect habitats for threatened species over the time of its operation.

In 2017, the Australian Panel of Experts on Environmental Law released a blueprint for a new generation of national environmental laws. The blueprint calls for sweeping changes to the way in which environmental protection in Australia operates.

These include:

- ensuring strategic national leadership on environmental protection
- focusing on bio-regional and development of regional environmental plans to protect biodiversity
- declaring specific areas of strategic commonwealth interests, such as threatened species
- establishing a national Environment Protection Agency and Environment Commission to implement national environmental law and set national standards respectively
- establishing clear procedural rights for environmental protection.

It is clear that more effective national protection measures are needed to secure habitats for threatened species. Australian national environmental law should provide unequivocal protections for critical habitats of threatened species and include targets for the retention of high conservation value ecosystems, in order to stop species becoming threatened in the first place.

Citizens must have the right to hold decision makers to account when they fail to implement the law, as threatened species can't stand up for themselves. Australians need to have faith that our national environmental law is being implemented independently and free from political interference.

The Australian government must lead on efforts to protect, conserve and restore nature and to meet our international commitments to end extinction.

Recommendations

- There needs to be national leadership on protecting native wildlife in Australia. This includes strong national laws that genuinely protect habitat destruction to address Australia's extinction crisis.
- The Australian government should institute a complete overhaul of the national environment laws to protect threatened species. This should be backed by strong and independent national institutions, including
 - an independent National Environmental Protection Authority that operates at arm's length from government to conduct transparent environmental assessments and inquiries as well as undertake monitoring, compliance and enforcement actions
 - an independent National Sustainability Commission that develops enforceable national environmental protection standards, bioregional plans as well as recovery and threat abatement plans.
- New laws should include a legislated requirement to develop science-based recovery plans for all threatened species that are enforceable, binding, and require climate impact assessment for species and their critical habitat.
- Australia's environment laws must ensure permanent protection of threatened species habitats and end deforestation of high conservation value forests and intact ecosystems.
- The Australian government should establish a new national critical habitat register which applies across all land tenures and enact law to protect ecosystems of national importance to better protect species before they become threatened.



If we are to address this crisis we need strong national leadership and national environmental laws that **genuinely protect wildlife.**

Toolangi Forest, VIC. Photo: Dale Cochrane

¹ Woinarski, J. C. Z. *et al.* (2011) 'The disappearing mammal fauna of northern Australia: Context, cause, and response', *Conservation Letters*, 4(3), pp. 192–201.

² WWF. 2016. Living Planet Report 2016. Risk and resilience in a new era. WWF International, Gland, Switzerland

³ Maxwell, S. M. *et al.* (2013) 'Cumulative human impacts on marine predators', *Nature Communications*. Nature Publishing Group.

⁴ Woinarski, J. C. Z., Burbidge, A. A. and Harrison, P. L. (2015) 'Ongoing unraveling of a continental fauna: decline and extinction of Australian mammals since European settlement', *Proceedings of the National Academy of Sciences of the United States of America*, 112(15).

⁵ De Vos, J. M., Joppa, L. N., Gittleman, J. L., Stephens, P. R. and Pimm, S. L. (2015), Estimating the normal background rate of species extinction. *Conservation Biology*, 29: 452–462. doi:10.1111/cobi.12380

⁶ Department of the Environment, Water, Heritage and the Arts, 2013 Significant Impact Guidelines 1.1 – Matters of National Environmental Significance <http://www.environment.gov.au/epbc/publications/significant-impact-guidelines-11-matters-national-environmental-significance>

⁷ Department of the Environment and Energy. – Case judgements <http://www.environment.gov.au/epbc/compliance-and-enforcement/case-judgments> Accessed 14 Aug. 2018.

⁸ Environment and Communications Committee, Environment and Energy Portfolio Question on notice no. 147 Portfolio question number: 147 2018-19 Budget estimates

⁹ National Land and Water Resources Audit 2001, Australian Native Vegetation Assessment 2001, National Land and Water Resources Audit, Canberra

¹⁰ Species of National Environmental Significance 10km Grids— User Guide <https://www.environment.gov.au/system/files/pages/1b2acb38-d05d-43e5-a0f6-c41d9f22cc19/files/snes-user-guide-10km-grids.doc> (Accessed 14 August 2018)

¹¹ WWF Australia Koalas Lost to Bulldozers in Queensland 2011–2016 <http://www.wwf.org.au/ArticleDocuments/360/pub-koalas-lost-to-bulldozers-in-queensland-2010-16-22nov17.pdf.aspx>

¹² Threatened Species Scientific Committee (2015). Conservation Advice Geophaps scripta scripta squatter pigeon (southern). Canberra: Department of the Environment. Available from: <http://www.environment.gov.au/biodiversity/threatened/species/pubs/64440-conservation-advice-31102015.pdf> In effect under the EPBC Act from 27-Oct-2015.

Appendix

Methods

To evaluate total habitat loss for threatened species, a number of spatial datasets were used (Table 3).

Table 3:
Overview of datasets used for analysis

NAME	SOURCE	RESOLUTION/SCALE	YEAR(S)
Burnt areas	AusCover and University of Maryland MODIS burned areas collection 45	250m-500m	2000-2017
Species of National Environmental Significance	Department of Environment and Energy	100m	2018
EPBC Act Referrals Spatial Dataset	Department of Environment and Energy	1km	2018
Forest cover	Department of Environment and Energy, National Greenhouse Gas Inventory (NCAS)	0.00025 dec. degr.	1991-2018
Land use	Australian Bureau of Agricultural and Resource Economics and Sciences	50m and 1000m	1997-2015
Major Vegetation Subgroups v5 preclearing	Department of Environment and Energy, National Vegetation Information System (NVIS)	100m	pre-clearing

We acknowledge that the species data provided is from the Commonwealth Department of the Environment: Species and Communities of National Environmental Significance Databases (2014). Forest loss was calculated using the Landsat satellite imagery to derive forest, sparse woody and non-woody land cover from 1988-2017. For the period 2000-2017 (the period of operation of the EPBC Act), we evaluated changes in forest or woodland loss both on a short term, mostly annual basis, and across the entire period – excluding losses that could be attributed to burning, areas already developed in 2000 at the start of the study period, and vegetation not mapped as forest or woodland cover (specifically shrubland, grassland or mallee vegetation). Areas lost and likely cleared were intersected with areas referred at two levels of confidence. This information was combined again with the national threatened species data, tracking referred versus unreferred forest and woodland

vegetation loss in likely and known habitats for any nationally listed threatened species. In this study, we use a 1-hectare threshold to indicate a significant impact.

Limitations

Forest cover

The major limitation with this study is the use of the NCAS forest cover dataset. This dataset has two missing years, 2001 and 2003, thus making it difficult to detect consistent annual forest change over that period. The NCAS data is said by the developers to be approximately 92% accurate in classifying vegetation as either forest, woodland or neither. However, there are major differences in Queensland between areas estimated by NCAS to have been cleared and Queensland government Statewide Landcover And Trees Study (SLATS), which consistently estimate greater areas cleared.

Fire masking

The other limitation is the difficulty in differentiating between bushfire and bulldozing of forests and bushlands. We removed areas that were mapped as burned areas products developed from MODIS satellite imagery over the same period of forest or woodland loss. Despite using MODIS burned areas to remove fire, it was evident from the location and pattern of forest loss detected, particularly in fire-prone woodlands of southwest Australia, that the masking was still missing significant areas of burning. This resulted in false positive signals of forest or woodland loss. We removed fire-prone mallee from the analysis to attempt to reduce false positives further. Conversely, the analysis also suffers from a false negative rate with respect to burning that is intentional and results in lasting damage to threatened species habitats, but which were excluded from the analysis.

Vegetation masking

Some woody vegetation can show a signal of forest or woodland loss, although it is neither in reality.

Accordingly we used the National Vegetation Information System Major Vegetation Subgroups Version 5.0 to mask out the following vegetation types which otherwise provide a false positive signal of forest or woodland loss: naturally bare or unknown/unclassified areas, shrubland or grassland, and mallee woodlands.

Land use masking

Land uses currently shown as "Conservation and natural environments", or simply as natural water areas like lakes, rivers and estuaries, were masked out because any forest and woodland change there was likely to have been due to natural processes like fire.

Likewise, if an area was mapped in an already developed land use as of 2000, the start of the study period, any forest or woodland loss was also masked out as unlikely to involve intact native habitat, and could even involve exotic vegetation for example.

Species of National Environmental Significance

Species of National Environmental Significance data provided by the Department of Environment has been generalised to a 100-metre grid resolution. The reason for this limitation is to mitigate the release of sensitive information, such as the whereabouts of highly threatened or rare species to avoid illegal collection or disturbance. In some cases, this generalised location of species can result in false positive habitat loss.

Further, habitat loss figures are for the full period of the operation of the EPBC Act, however some species may have been listed after that period (such as the koala which was listed in 2012). This does not call into question the habitat loss figures, but does indicate challenges with assessing compliance for habitat loss for recently listed species. Known and likely habitat loss cannot be added together to equal 7.47 million hectares, as some known species habitat areas overlaps likely species habitat for others. Therefore, to avoid overcounting, the 7.47 million hectares is comprised of areas that are only likely habitat, only known habitat and areas that are both known and likely habitat.



