@BrenWintle

Extinction crisis, ecosystem collapse & fun afternoon tea topics

Prof. Brendan Wintle (and hundreds of others)

I acknowledge the Traditional Owners of the land on which I work, the Wurundjeri people of the Kulin Nations, and pay my respects to their Elders, past, present and future.

THE UNIVERSITY OF MELBOURNE

Threatened Species Recovery Hub

National Environmental Science Programme

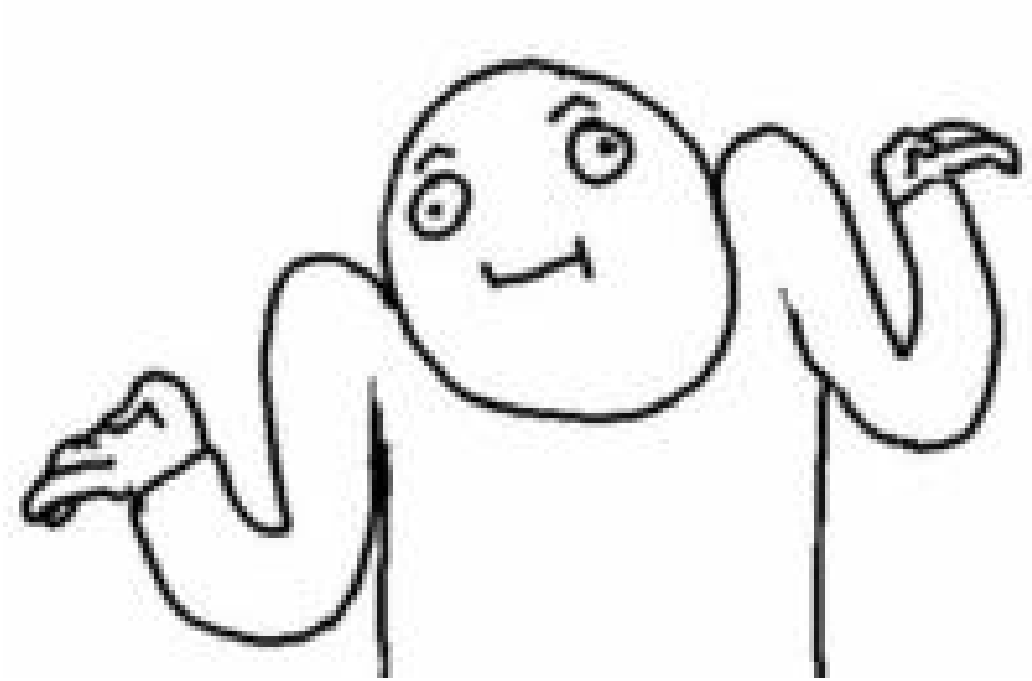
We made a promise…

- **Aichi Target 12**: "…by 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained" (CBD 2010)

SUSTAINABLE DEVELOPMENT GOALS

15.5 Take urgent and significant action to reduce the degradation of natural habitats, **halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species**

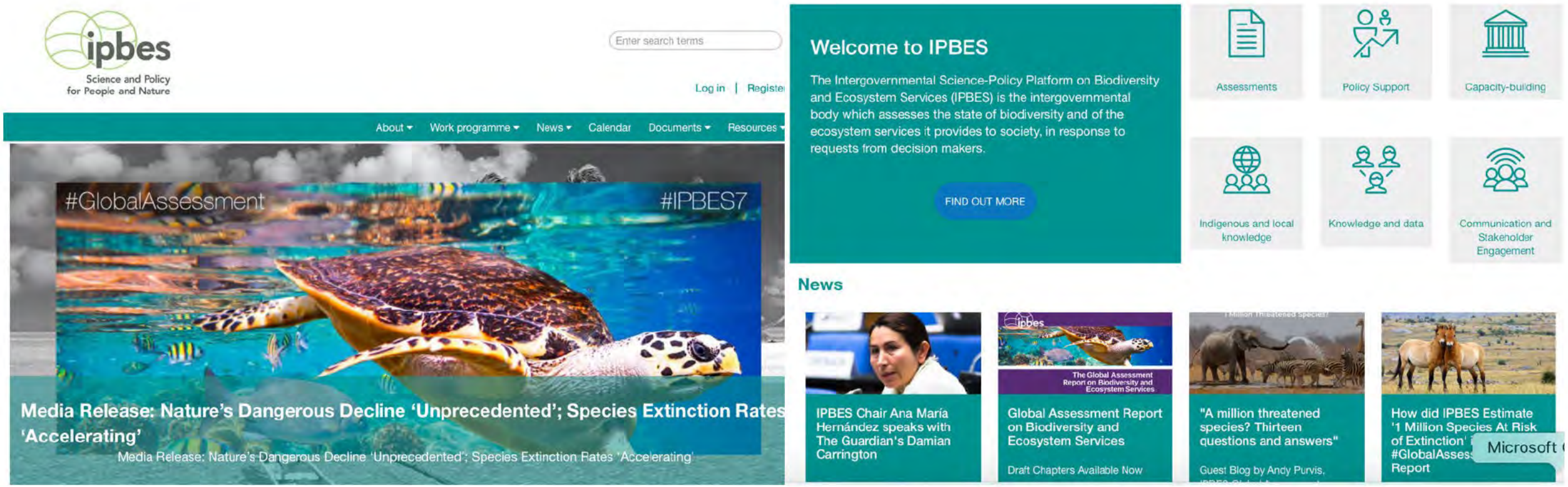
So how are we doing?



IPBES Global Assessment

(Intergovernmental platform for biodiversity and ecosystem services)

UN environment
United Nations Environment Programme



https://ipbes.net

What did they find?

Nature underpins all aspects of life

- 2 billion people rely on wood as their primary energy
- 4 billion people rely primarily on natural medicines
- 70% of all drugs are natural or copies of natural drugs
- 75% of all crops are animal pollinated
- Natural systems are the ONLY carbon sink (5.6 Gt/yr)
- Natural pollinators = $560B/yr

… but its capacity to do so is declining everywhere

REGULATION OF ENVIRONMENTAL PROCESSES

Nature's contribution to people	50-year global trend	Directional trend across regions	Selected indicator
1 Habitat creation and maintenance	↓	○	• Extent of suitable habitat • Biodiversity intactness
2 Pollination and dispersal of seeds and other propagules	↓	○	• Pollinator diversity • Extent of natural habitat in agricultural areas
3 Regulation of air quality	↘	↓↑	• Retention and prevented emissions of air pollutants by ecosystems
4 Regulation of climate	↘	↓↑	• Prevented emissions and uptake of greenhouse gases by ecosystems
5 Regulation of ocean acidification	→	↓↑	• Capacity to sequester carbon by marine and terrestrial environments
6 Regulation of freshwater quantity, location and timing	↘	↓↑	• Ecosystem impact on air-surface-ground water partitioning
7 Regulation of freshwater and coastal water quality	↘	○	• Extent of ecosystems that filter or add constituent components to water
8 Formation, protection and decontamination of soils and sediments	↘	↓↑	• Soil organic carbon
9 Regulation of hazards and extreme events	↘	↓↑	• Ability of ecosystems to absorb and buffer hazards
10 Regulation of detrimental organisms and biological processes	↓ ↘	○ ○	• Extent of natural habitat in agricultural areas • Diversity of competent hosts of vector-borne diseases

DIRECTIONAL TREND

Decrease ← → Increase

Gloal trends ↓ ↘ → ↗ ↑

Across regions ○ Consistent ↓↑ Variable

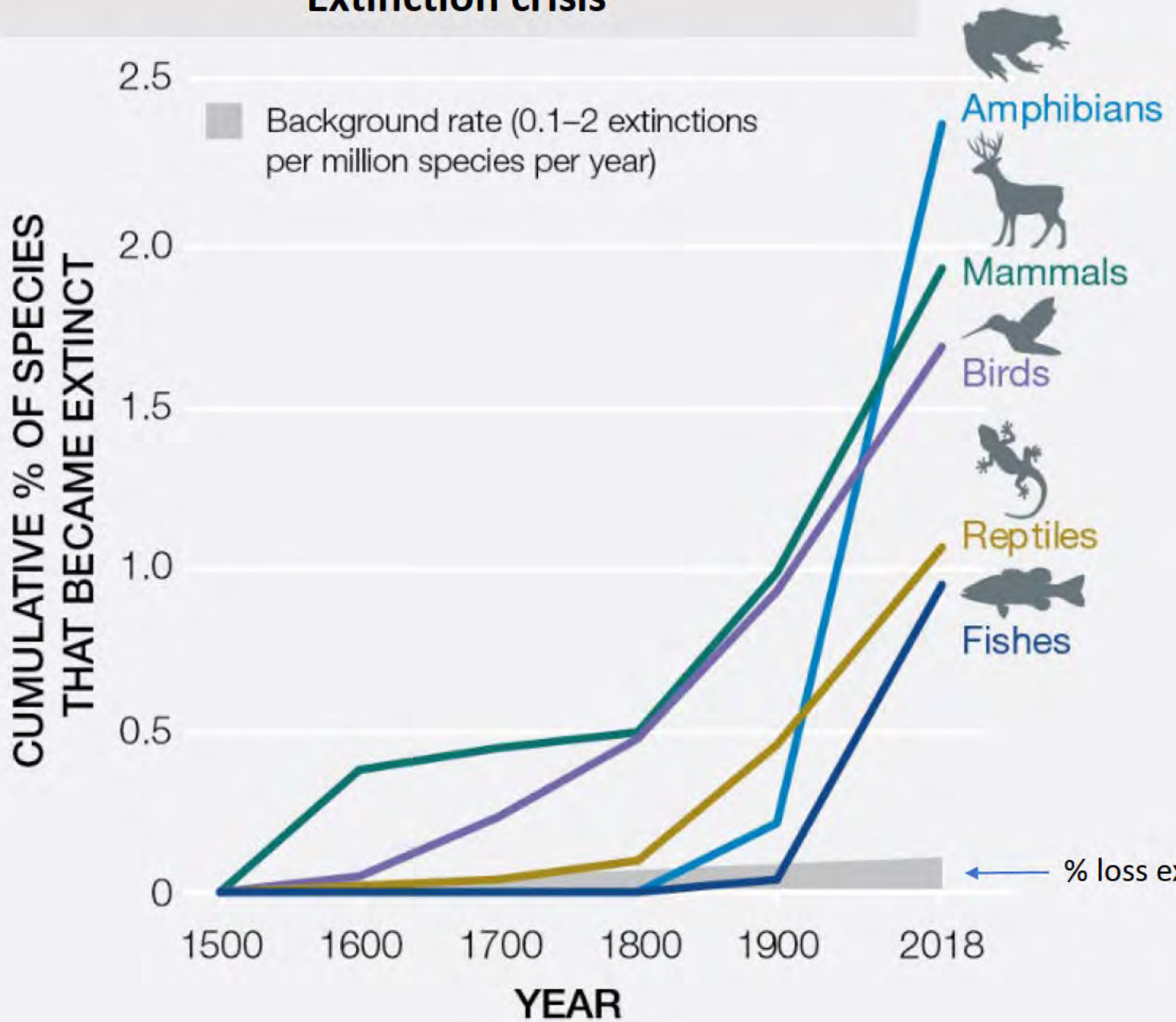
LEVELS OF CERTAINTY

- Well established
- Established but incomplete
- Unresolved

Pollinator loss

- 90 per cent of wild flowering plant and 80% of crop species depend animals/insects for pollination
- 75% decline over 27 years in flying insect biomass in Europe (Hallmann 2017)
- 16% of pollinators and 30% of bees assessed are at risk of extinction (IUCN)
- $560B/yr crop productivity at risk from wild pollinator loss

Extinction crisis



What are the global drivers?

- **75%** of the land area is significantly altered;
- **66%** of the ocean area is experiencing increasing cumulative impacts;
- **85%** of wetland area has been lost
- Half the live coral cover on coral reefs has been lost since 1870 – loss accelerating
- Marine plastic pollution increased tenfold since 1980
- 32 million hectares of primary or recovering tropical forest were lost between 2010 and 2015

Australia – a unique, megadiverse nation

- 1 of 17 mega-diverse nations
- More species than any other developed nation
- Endemism - 87% mammals, 93% reptiles, 94% frogs found only here





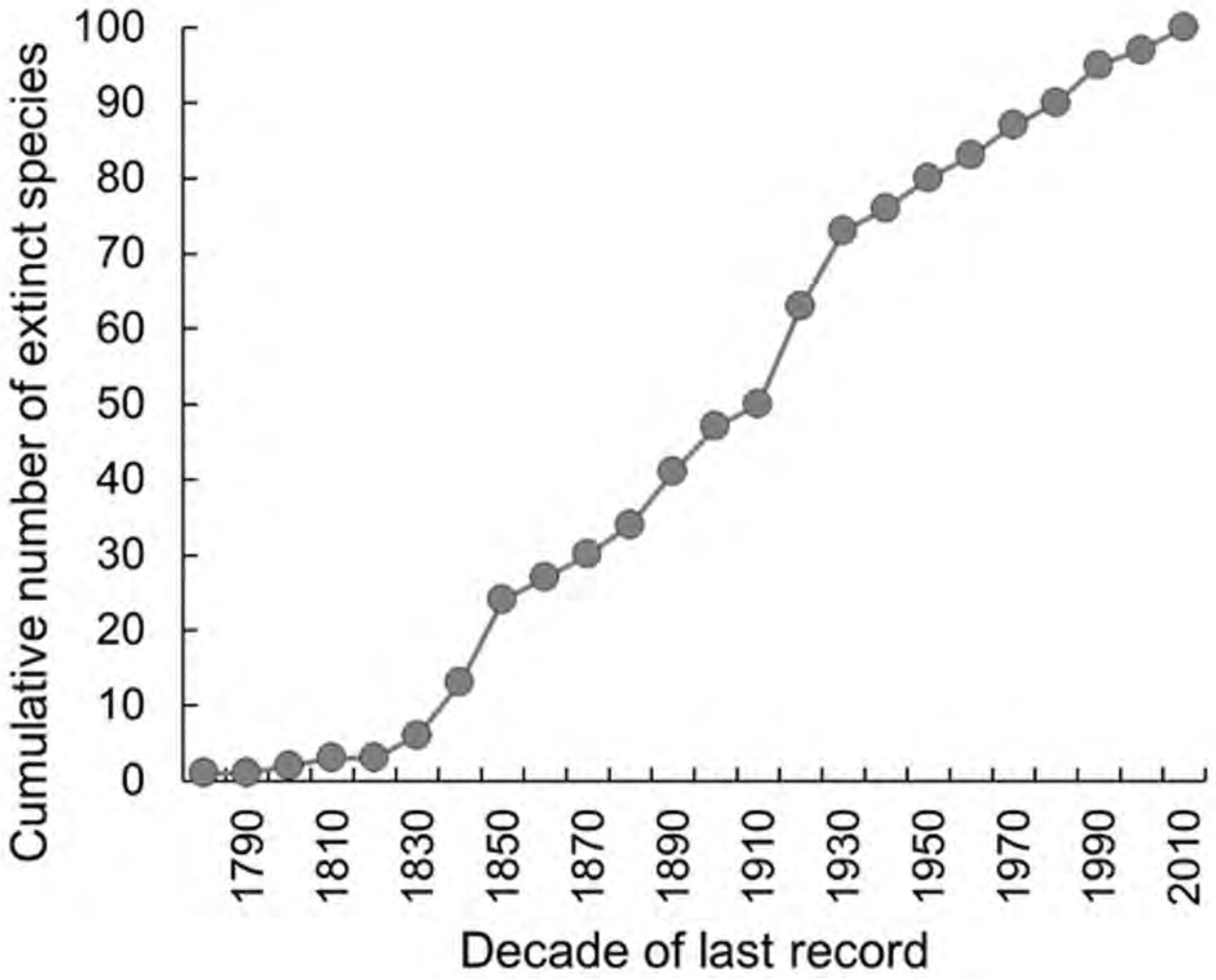
In Australia…


Lindy Lumsden

- 110 extinctions since European invasion
- 81 existed in Victoria
- 1800 now listed as at high risk
- 35% of all modern global mammal extinctions


Australian Geographic

History of Australian extinctions



Including 34 mammals

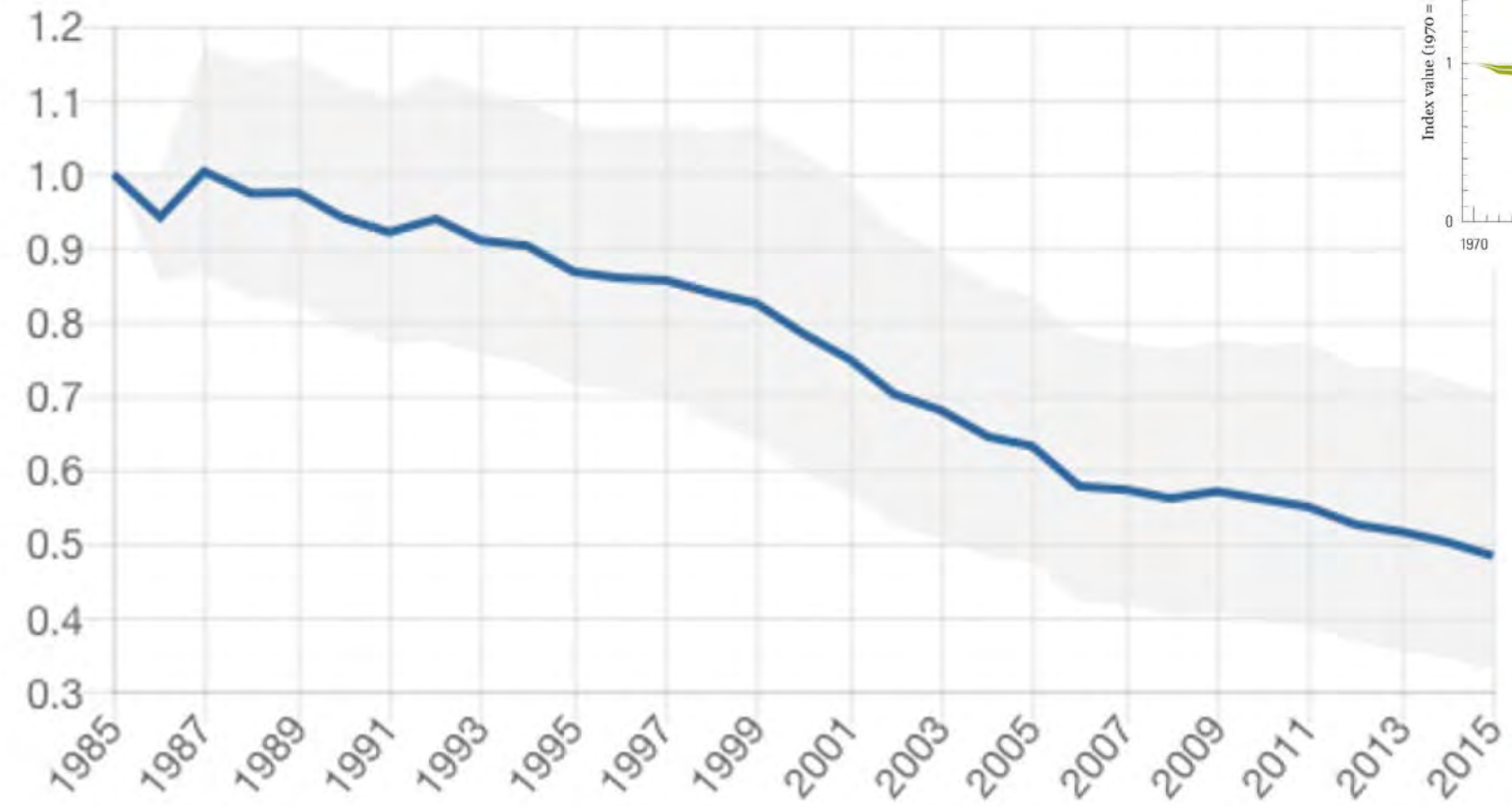
The Australian Threatened Species Index – Part 1: Birds

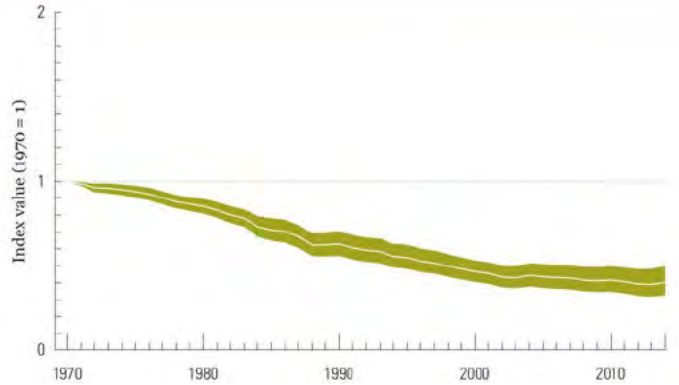
birdlife AUSTRALIA

Threatened Species Recovery Hub

National Environmental Science Programme

Main index





What's driving our losses?

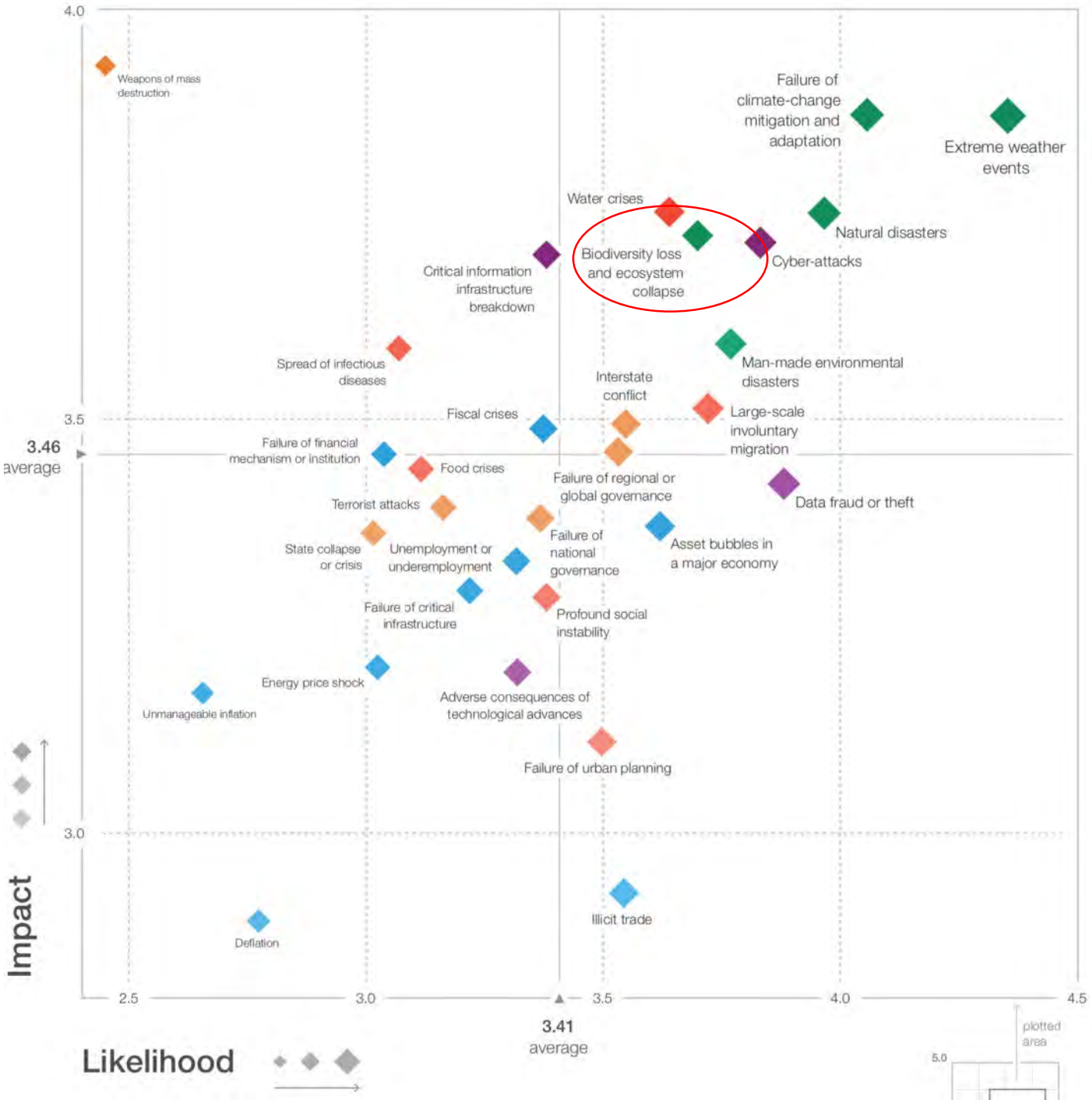
Stephen Kearney

“Goals for conserving and sustainably using nature **cannot be met under current trajectories**… only transformative change will allow goals to be met by 2030”. (IPBES 2019)

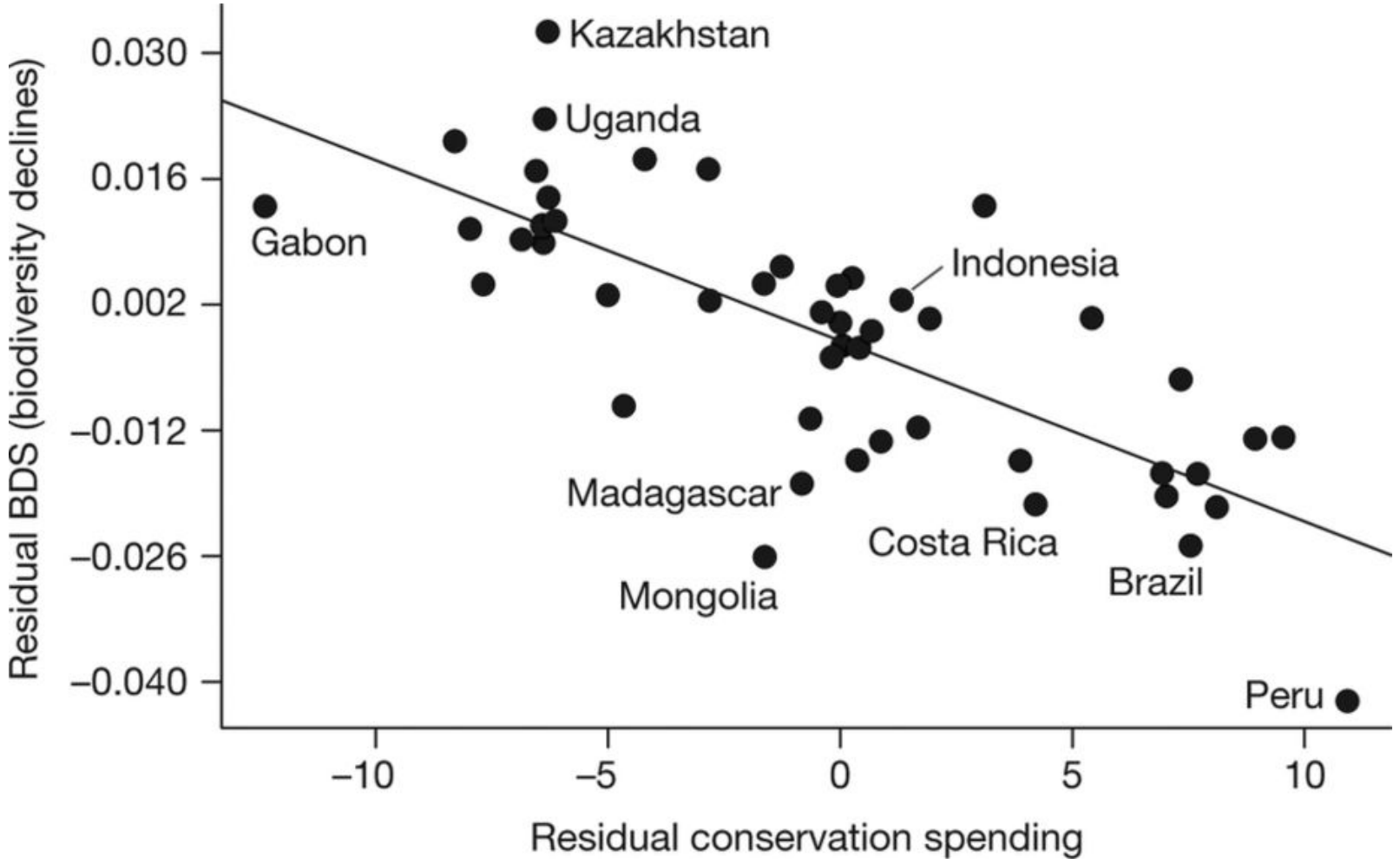
WORLD ECONOMIC FORUM

The Global Risks Report 2019

5 of the top 10 risks to global economy are environmental, including biodiversity loss

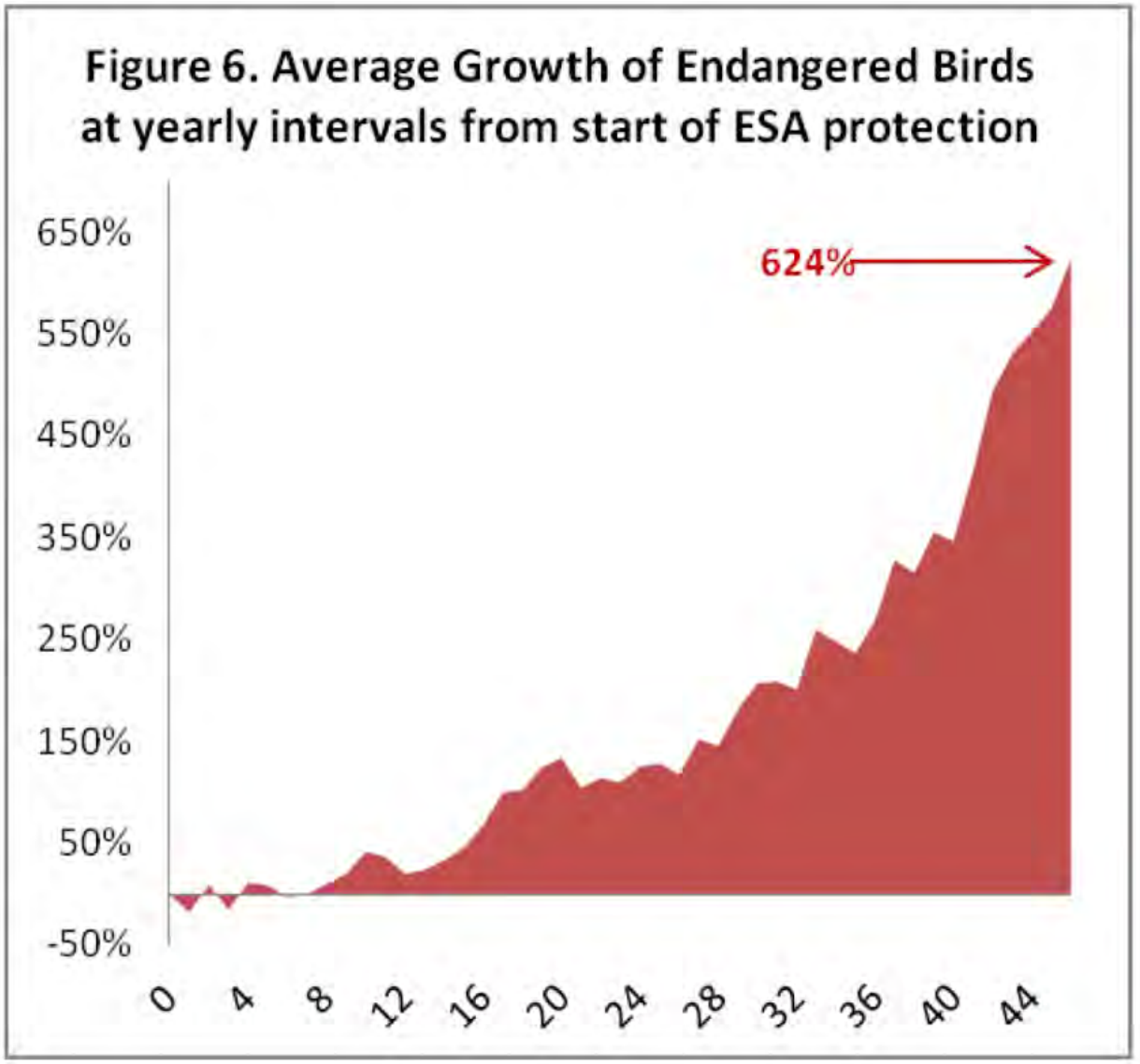


Finally - some good news



Waldron et al 2017. *Nature*.

More good news

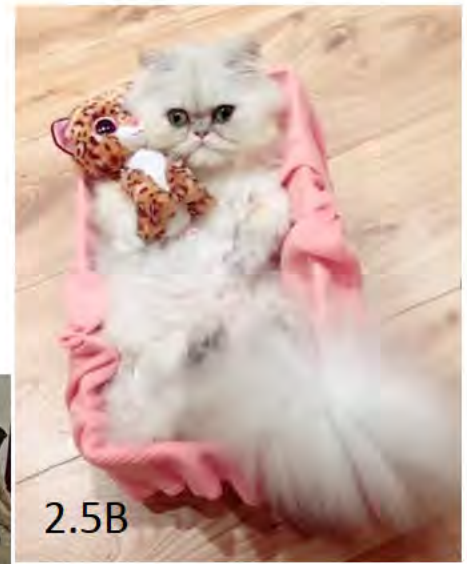


Suckling *et al.* 2016

What we're spending on biodiversity and TS

Funding needs

Taxa	USA Allocated funding in AU$'000	Number of species (EPBC Act*)	Estimated expenditure to recover in AU$'000	
	Median		Using medians	Using means
Plant	$70	1336	$93,775	$222,579
Invertebrate	$168	65	$10,899	$27,720
Fish	$282	58	$16,375	$161,542
Amphibian	$689	37	$25,490	$55,391
Reptile	$1,009	61	$61,538	$162,346
Bird	$4,501	134	$603,086	$612,140
Mammal	$932	107	$99,691	$446,143
TOTAL			**$911M**	**$1,688M**



Victoria – 300M/yr

POLICY PERSPECTIVE

Conservation Letters

WILEY

Spending to save: What will it cost to halt Australia's extinction crisis?

Brendan A. Wintle PhD[1] | Natasha C.R. Cadenhead MSc[1] | Rachel A. Morgain PhD[2] | Sarah M. Legge PhD[2,3] | Sarah A. Bekessy PhD[4] | Matthew Cantele MA[1] | Hugh P. Possingham PhD[3,5] | James E.M. Watson PhD[3,6] | Martine Maron PhD[3] | David A. Keith PhD[7] | Stephen T. Garnett PhD[8] | John C. Z. Woinarski PhD[8] | David B. Lindenmayer PhD[2]

Recommendations

1. A Victorian Saving Our Species Program (300M/yr)
   - Targeted action for most urgent threatened species
   - Joint conservation programs on Ag lands (56% of Victoria's land area)
   - Systematic monitoring of the state and trends of threatened species and ecosystems – and measuring effect of management
   - Biodiversity sensitive urban design
   - Icon/cultural species in schools
   - Co-investment in private and Indigenous managed lands for conservation

   - **Benefits**: Raising the public profile of threatened species, connecting people to their local threatened species, leverage effort, demonstrable benefit – show what focused action can achieve

Recommendations

2. Embrace strong National Environmental Standards under EPBC Act reforms (hold Commonwealth accountable to Samuel's Review)

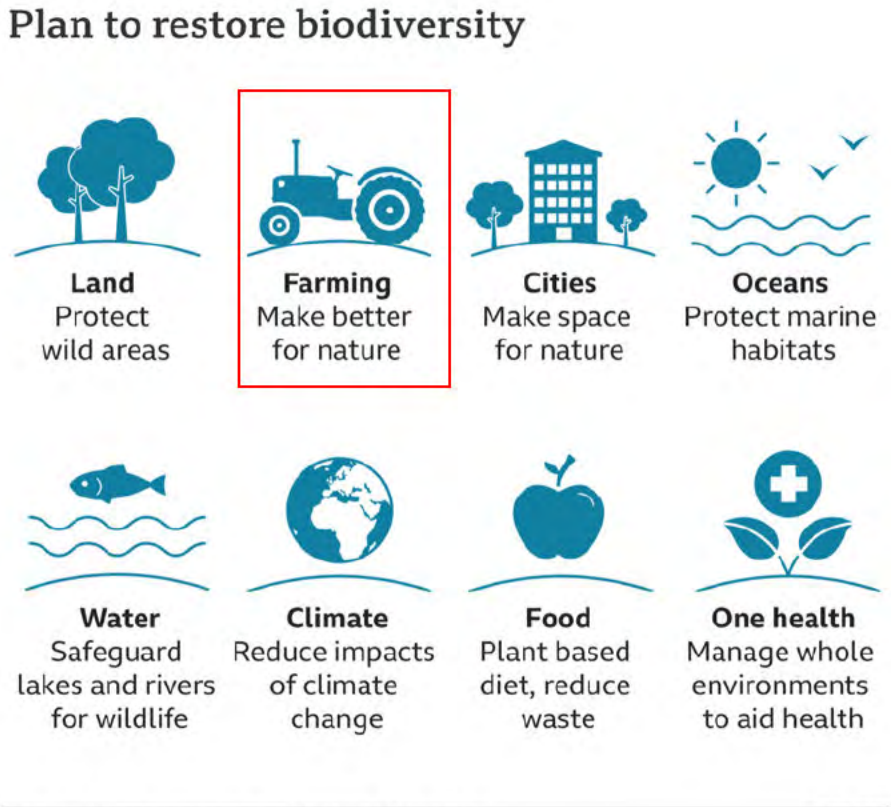
- Strong protection of critical habitats
- Reduced emphasis on offsets (last resort only)
- Strong evidence base of scientific monitoring
- Decisions underpinned by regional planning to reduce cumulative impacts

https://theconversation.com/to-fix-australias-environment-laws-wildlife-experts-call-for-these-4-changes-all-are-crucial-154273

Biodiversity-friendly farming practices

~56% of Victoria's land mass is used for agriculture

RICEGROWERS' ASSOCIATION OF AUSTRALIA INC



Tiverton farm:
A sheep farm for bandicoots or a bandicoot farm for sheep?

https://www.sbs.com.au/news/the-fight-to-save-one-of-australia-s-most-endangered-native-animals-from-extinction

Icon species in schools

Indigenous land management

Indigenous people own and manage 44% of the NRS (>8% of Australia)

Joint land management project reconnecting Dja Dja Wurrung people with their land

ABC Central Victoria / By Beth Gibson

Posted Mon 28 Sep 2020 at 8:10am

Dja Dja Wurrung man Harley Douglas grew up near Kalimna Park, and is now working to bring back Indigenous management of the land. *(ABC Central Victoria: Beth Gibson)*

Biodiversity sensitive urban design

Sarah Bekessy RMIT

Professor Brendan Wintle

[redacted]

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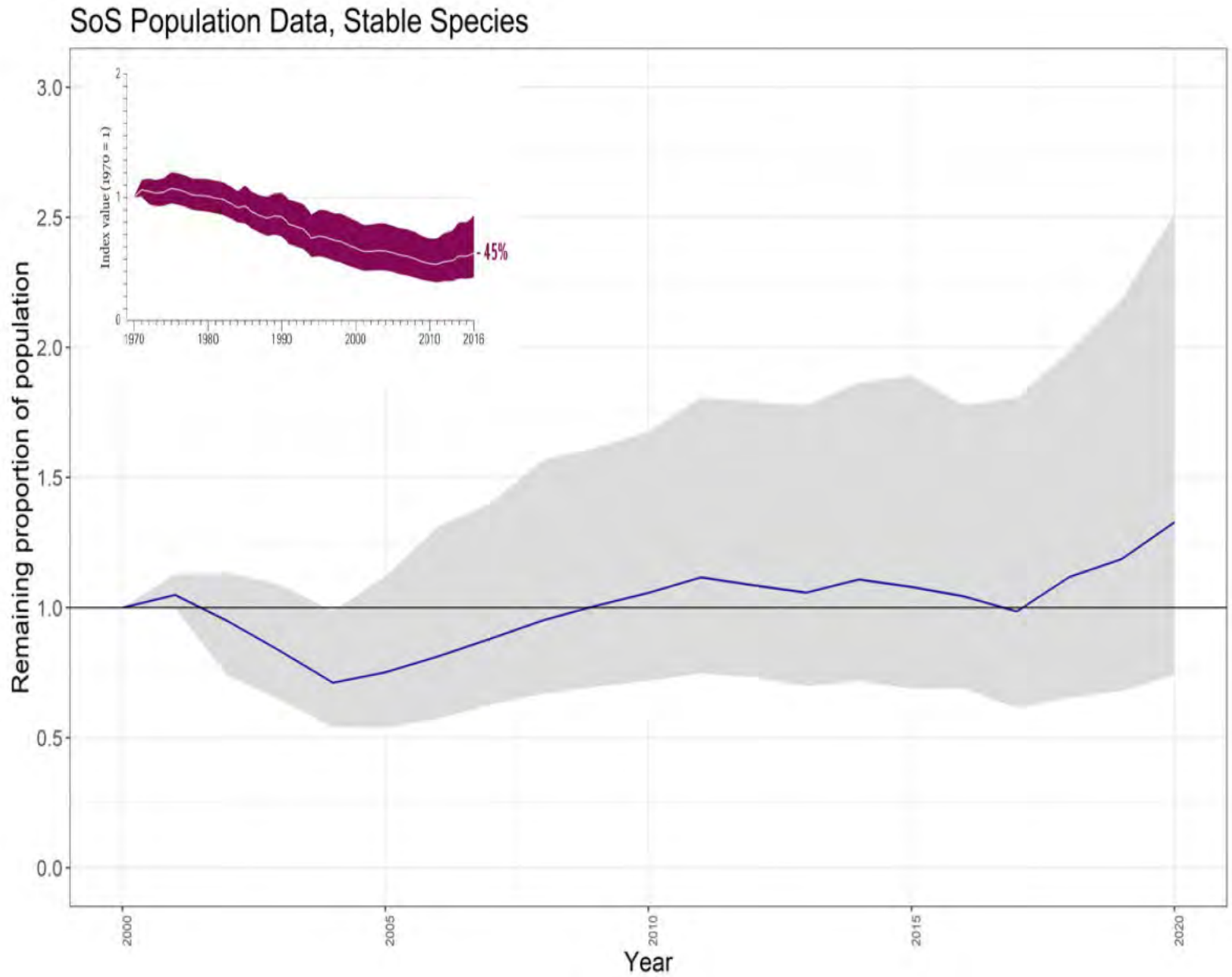
www.nespthreatenedspecies.edu.au


SoS Population Data, Stable Species
Remaining proportion of population
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2000
2005
2010
2015
2020
Year
Index value (1970 = 1)
2
1
0
1970
1980
1990
2000
2010
2016
-45%