

Recovering nature
for the benefit of
people and planet

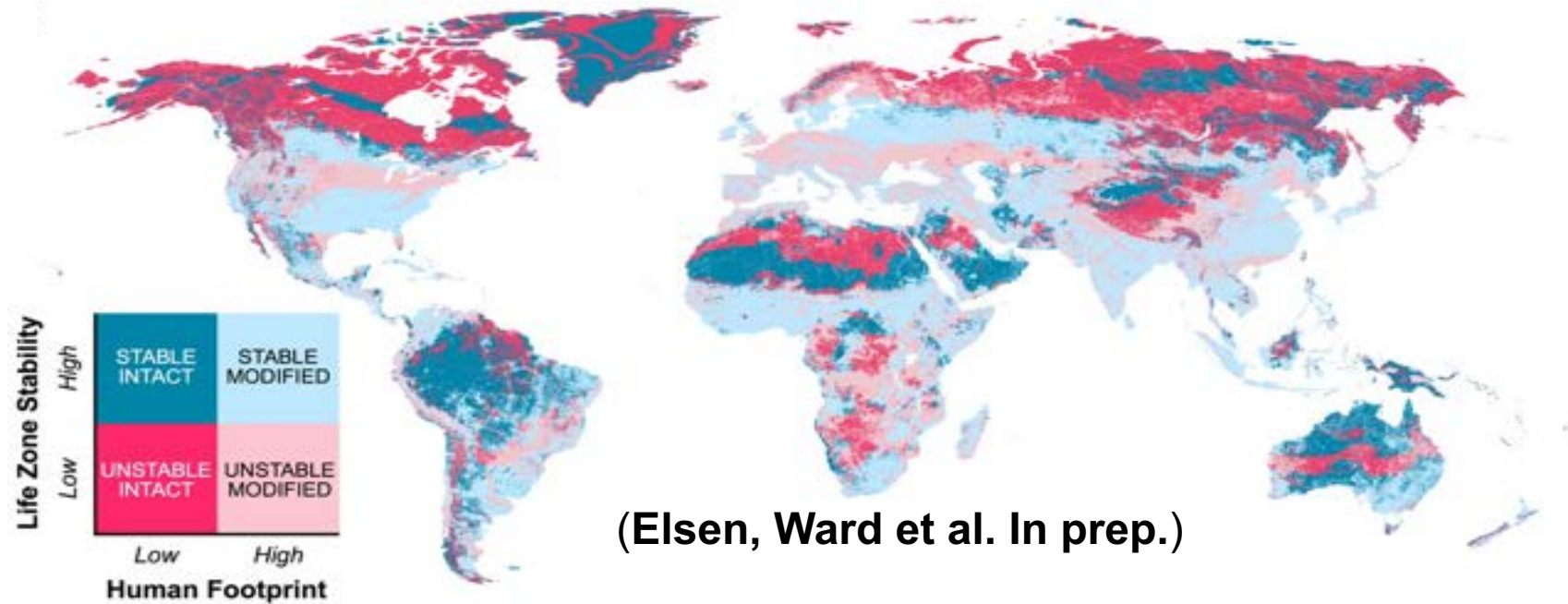
Dr. Michelle Ward
Griffith University



I acknowledge the First Nations of the lands and waters of Australia, particularly those here on Gubbi Gubbi Country, pay my respect to their Elders past and present and express gratitude for long and ongoing custodianship of Country.

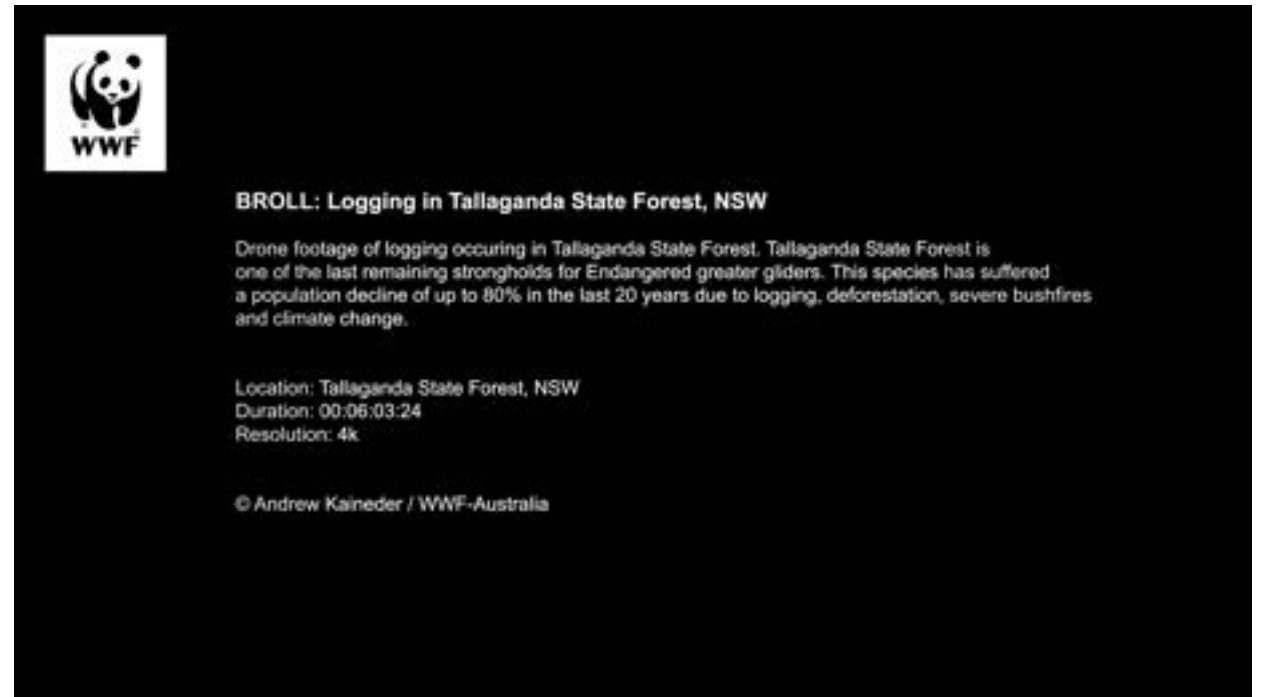
Understanding the state of play

- Dual crises of biodiversity loss and climate change
- >50% land has been moderately/severely altered (**Williams, et al. 2020.**)
- >90% of protected area network disconnected (**Ward et al. 2020. *Nature Communications***)
- Climate change will impact >42% of land (**Elsen, Ward et al. 2021.**)
- <19% is free of human pressure and will be climate stable (**Elsen, Ward et al. In prep**)



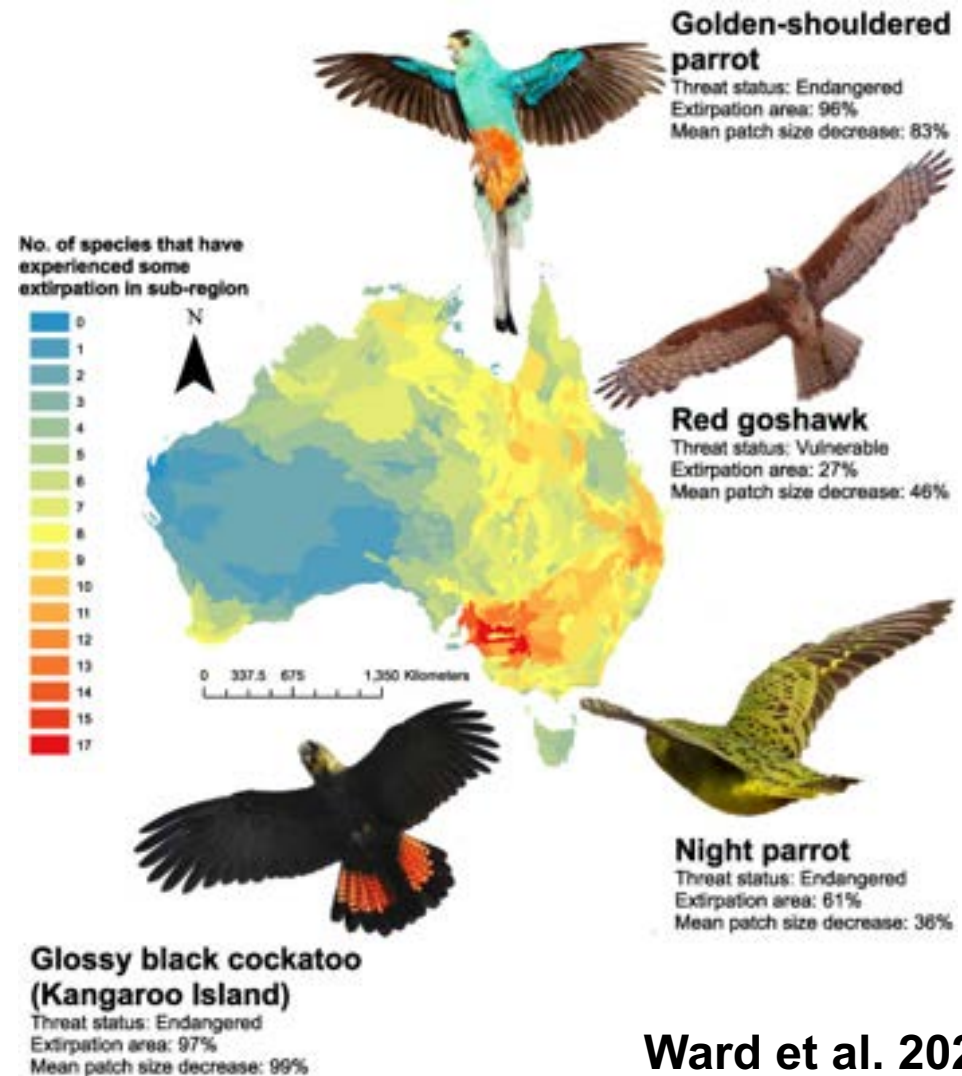
Understanding the state of play

- Australia is not immune to the problem
- We assume that Australia is a developed country with progressive governance on environmental management, and we would have strong policies to mitigate these threats.
- One of the highest threatened species list and the most mammals that have gone extinct.
- Between 2000-2017, 7.7 million ha of clearing occurred within threatened species habitat, only 7% was regulated (**Ward et al. 2019**)
- This is a direct failure of our federal environmental legislation (**Ward et al. 2022. *Science***)
- Also a failure of other environmental legislations (**Thomas, et al. In prep**)
- Huge areas remain targeted for clearing (**Brunton, et al. 2023. *Science***)



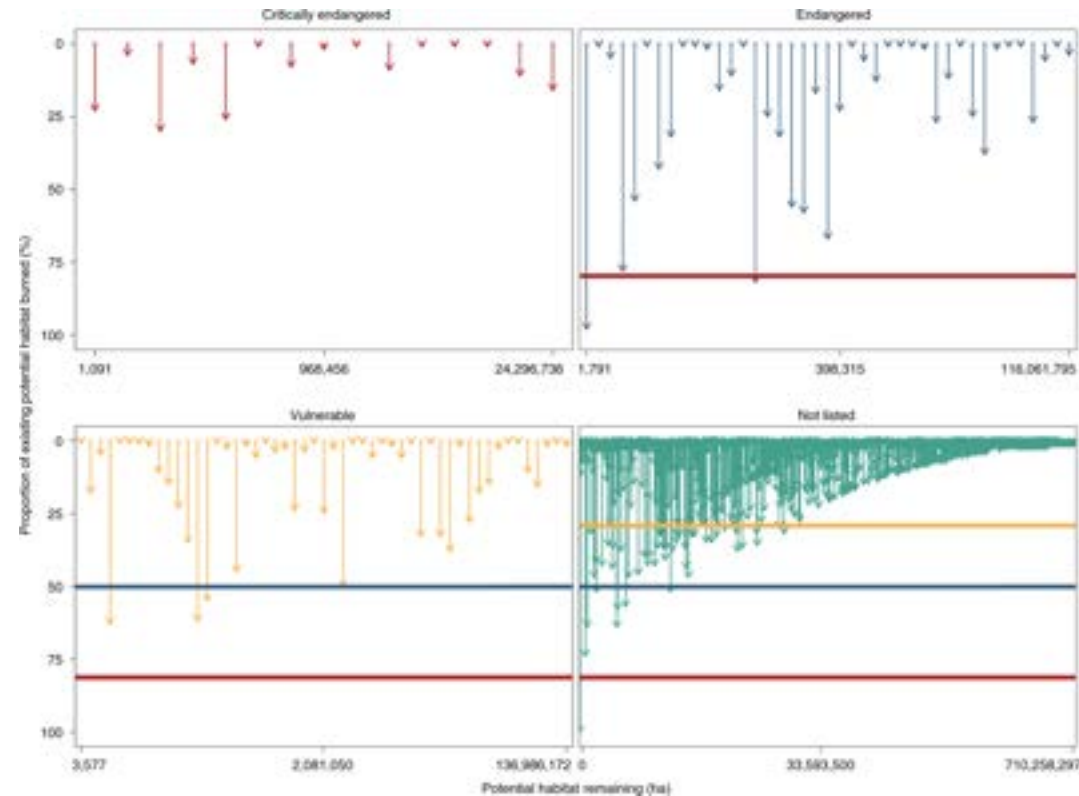
Understanding the state of play

- Pasture accounts for 85% of clearing in Queensland (**Ward et al. 2023**)
- But it's not just clearing that is impacting our iconic species, its disease (**Ward et al. 2021**), invasive predators (**Neilly, et al. 2022**), logging (**Lindenmayer, et al. 2020, Nature EE**)
- This has resulted in massive extirpation across the nation (**Ward et al. 2022**)



Understanding the state of play

- One of the emerging threats is regime shifts of fire (**Ward et al. 2019**)
- Climate change and poor land management, resulted in the 2019-2020 megafires burning ~97,000 km² (**Ward et al. 2020 *Nature EE***)
- 41% were within the protected area estate (**Ward et al. 2022**)
- Some species were so badly impacted, they required uplisting or listing, representing 26% increase in EPBC Act (**Legge, et al. 2023**).
- Modelling the spatial extent of post-fire sedimentation threat to estimate the impacts of fire on waterways and aquatic species, found 44 species were severely impacted by slug events (**Ward et al. 2022; Whiterod, et al. 2023**).



Ward et al. 2020

Developing practical solutions

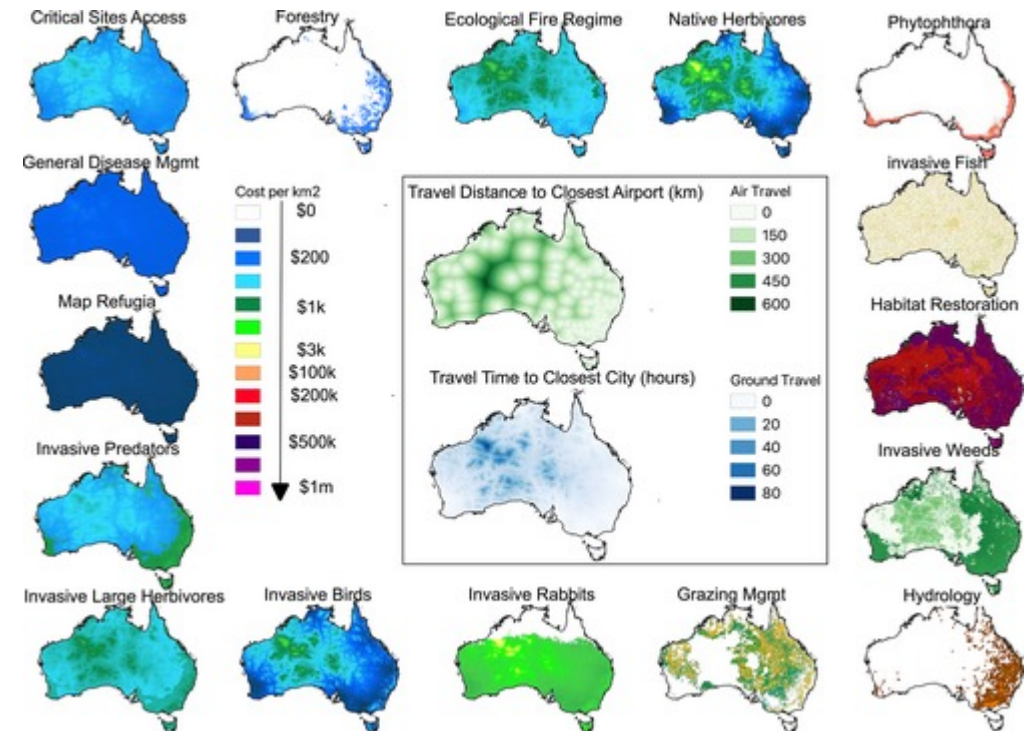
- As part of the Kunming-Montreal Global Biodiversity Framework, nations of the Convention on Biological Diversity (CBD) aim to protect at least 30% of the planet by 2030 (**Target 3**)
- Currently, Australia sits at about 22.1% protected (Ward et al. 2020)
- Where should we expand to?
- The Australian Government has a bad habit of putting PAs in places that were never going to be cleared or just don't provide protection of conservation values. (Fuller et al. 2010)
- "Ensure and enable that by 2030 at least 30% of terrestrial and inland water areas, and of marine and coastal areas, **especially areas of particular importance for biodiversity and ecosystem functions and services, are effectively conserved and managed through ecologically representative, well- connected and equitably governed systems of protected areas and other effective area-based conservation measures, recognizing indigenous and traditional territories**, where applicable, and integrated into wider landscapes, seascapes and the ocean, **while ensuring that any sustainable use, where appropriate in such areas, is fully consistent with conservation outcomes, recognizing and respecting the rights of Indigenous peoples and local communities, including over their traditional territories.**"

Breaking down the target

Component	What it means
....especially areas of particular importance for biodiversity...	<ul style="list-style-type: none">• Rare or threatened species and habitats, and the ecosystems that support them• Threatened and/or collapsing ecosystems• Globally significant ecosystems (e.g., Gondwanan rainforests, coral reefs)• Areas with a high level of ecological integrity• Areas important for all life stages of species• Climate refugia
....and ecosystem function and services...	<ul style="list-style-type: none">• High carbon• Waterbodies
...ecologically representative...	<ul style="list-style-type: none">• Representative natural ecosystems
...well-connected...	<ul style="list-style-type: none">• Areas of importance for ecological connectivity
...effectively conserved and managed ...	<ul style="list-style-type: none">• Managing all threats within these areas to ensure healthy populations of species and ecosystems
...equitably governed...	<ul style="list-style-type: none">• All stakeholders are involved in management and decision-making, particularly indigenous peoples and local communities

Informing budgets

- Budgeting for biodiversity conservation requires realistic estimates of threat abatement costs, so we built spatially-variable action and cost maps for continental Australia (**Yong, et al. 2023**)
- Wildlife recovery spending after Australia's last megafires was one-thirteenth the \$2.7 billion needed (**Ward et al. 2022**)
- ~\$15 billion to halt extinction for 110 priority species (**Ward, et al. In prep**)



Yong, et al. 2023

Coming soon...

- How much does it cost to effectively conserve and manage Australia's current protected area estate?

