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Protecting Australian wilderness

1 10 2009

Today I highlight a new paper just out online in *[Diversity and Distributions](#)* by James Watson and colleagues: [Wilderness and future conservation priorities in Australia](#). It's certainly one for the [Potential](#) list.



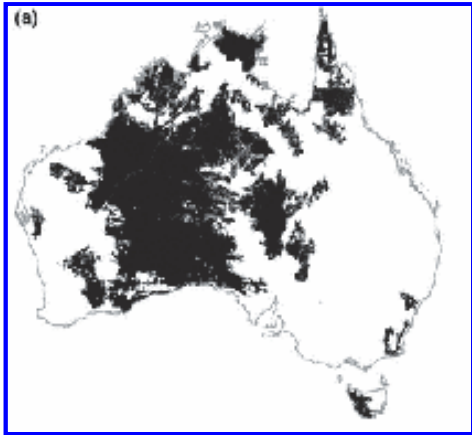
Jim Jim Falls, Kakadu National Park

Australia has a pretty bad biodiversity conservation track record – we have some of the [worst mammal extinction trends](#) in the world, and we've lost at least 50 % of our forested area since European colonisation. Despite our relatively large system of parks and reserves, things aren't going to well (even in the [parks!](#)).

Our rapidly expanding influence means that we have to start protecting larger and larger areas if we want to have any chance of slowing the modern extinction crisis. This means we have to go beyond dedicated biodiversity reserves and sequester more 'wilderness' (defined as "...*large areas that have experienced minimal habitat loss*"). Watson and colleagues therefore used Australia as a

good example to determine the extent to which the national protected area network captures 'wilderness', and how Australia's planned expansion of the reserve system will include 'wilderness' in the future.

Although there wasn't much planning involved initially, Australia (like many other countries) started to take biodiversity conservation seriously in the mid-1990s, such that now we have about 11 % of our 7.7 million km² land area within a National Reserve System. Planning didn't feature heavily in the early years, but it has been embraced now by nearly all planning bodies within government.



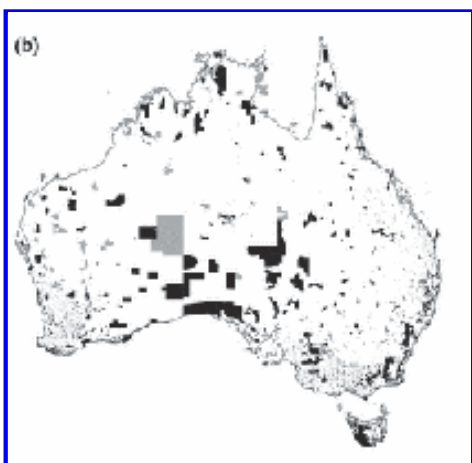
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Using estimates of the total wilderness area in Australia (Fig. a), Watson and colleagues determined how much was included in the Reserve System (Fig. b), and how this value changed between 2000 and 2006.

Of the 2.93 million km² of wilderness (38 % of land area, mostly in northern and western Australia), only 14 % was protected in 2000. This value increased marginally to 19 % by 2006 as the size of the Reserve System itself increased by 37 % (i.e., from 652597 to 895326 km²).

Bottom line – our growth in reserve area didn't really capture the necessary wilderness; instead, gains were made in areas largely modified by humans. Even where wilderness has been captured, it's predominately in 'multiple use' regions (incorporating mining, forestry and grazing, for example).

This isn't a bad thing really – by focussing on areas of high biodiversity value that are under relatively high threat embraces the [biodiversity hotspot](#) approach to conservation and emphasises restoration. This is, of course, needed. But not incorporating a wider component of the habitats within wilderness could bias conservation toward range-restricted species.



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Watson and colleagues therefore make a number of recommendations:

1. We should strive to quantify and map spatially the important ecological and evolutionary processes that drive the distribution and abundance of biodiversity so they can be explicitly incorporated into reserve area prioritisations.
2. We should focus on predicting the magnitude and distribution of future threats and incorporate them into the spatial prioritisation framework.
3. We should incorporate realistic constraints (e.g., financial costs) into prioritisation.
4. We need to map and analyse a range of social and economic factors that define opportunities for conservation in conjunction with information on conservation values, threats and costs.

The bottom line is that we need to find a better balance between planning that protects threatened species and ecosystems in already highly fragmented (threatened) landscapes, and planning that protects large areas of wilderness that still contains most of its conservation values (wilderness). We're getting there, but slowly, and hopefully in time to save our remaining threatened species from extinction.

[CJA Bradshaw](#)



Watson, J., Fuller, R., Watson, A., Mackey, B., Wilson, K., Grantham, H., Turner, M., Klein, C., Carwardine, J., Joseph, L., & Possingham, H. (2009). Wilderness and future conservation priorities in Australia *Diversity and Distributions* DOI:

[10.1111/j.1472-4642.2009.00601.x](https://doi.org/10.1111/j.1472-4642.2009.00601.x)

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[Conservation Scholars: Daniel Pauly](#)

3 12 2008

This series on [ConservationBytes.com](#) takes a page out of our book [Tropical Conservation Biology](#) (Sodhi, Brook & Bradshaw) – therein we produced a series of ‘Spotlights’ describing the contributions of great thinkers to conservation science. Each highlight of a **Conservation Scholar** includes a small **biography**, a list of major **scientific publications** and a **Q & A** on the person’s particular area of expertise.

Our seventh Conservation Scholar is [Daniel Pauly](#)...



Biography

After completing my doctorate studies in Germany in 1979, I spent many years at the [International Centre for Living Aquatic Resource Management](#) (ICLARM), then in Manila, Philippines, where I developed methods for tropical fish stock assessment, which I applied and taught in many tropical developing countries. I became a Professor at the [University of British Columbia's Fisheries Centre](#) in 1994, and its Director in 2004. My scientific focus has mainly been on the management of fisheries and ecosystem modelling, comprising over 500 contributions to peer-reviewed journals, authored and edited books, reports and popular articles. The concepts, methods and software I have (co-)developed are in use throughout the world. This applies notably to the ecosystem modelling approach incorporated in the [Ecopath software](#), to [FishBase](#), the online encyclopaedia of fishes, and the [global mapping of fisheries trends](#). My work has received numerous awards, notably the [Cosmos Prize](#) (2005, Japan) and the [Volvo Environment Prize](#) (2006, Sweden). Profiles on me and my work were published in Science on 19 April 2002, Nature on 2 January 2003, The New York Times on 21 January 2003, and in other publications.

Major Publications

- Pauly, D., Alder, J., Bennett, E., Christensen, V., Tyedmers, P. & Watson, R. (2003). [The future for fisheries](#). *Science* 302, 1359-1361
- Pauly, D. Christensen, V., Guénette, S. Pitcher, T.J., Sumaila, U.R., Walters, C. J., Watson, R. & Zeller, D. (2002) [Towards sustainability in world fisheries](#). *Nature* 418, 689-695
- Watson, R. & Pauly, D. 2001. [Systematic distortions in world fisheries catch trends](#). *Nature* 414, 534-536
- Pauly, D., Christensen, V., Dalsgaard, J., Froese, R. & Torres Jr, F. C. (1998) [Fishing down marine food webs](#). *Science* 279, 860-863 (see [previous post](#) on this paper and the [Classics](#) section)
- Pauly, D. & Christensen, V. (1995) [Primary production required to sustain global fisheries](#). *Nature* 374, 255-257.

Questions and Answers

1. *Which type of fisheries – commercial, recreational or artisanal – represents the greatest exploitative threat to tropical marine ecosystems?*

All fisheries have the potential of depleting the resources they exploit. Industrial fisheries, however, are extremely effective at what they do, and they have over a short period a devastating effect on their resource base.

2. *What fisheries management practices can be used to counter the phenomenon you have described as 'fishing down marine food webs'?*

Establishing large marine protected areas, and strict controls over the remaining, fished areas.

3. *Why are freshwater and lacustrine systems so sensitive to human-induced environmental change?*

Because they are small systems compared to the reach of our industries (fishing, pollution, habitat modification, etc). The oceans are larger, and hence the human impacts appeared later.

4. *How effective are marine protected areas (MPAs) in conserving tropical biodiversity, and should alternative solutions also be pursued?*

MPAs should never be seen as sufficient by themselves. Conventional management is needed too.

5. How can scientists work to overcome misconceptions in policy and public perception that arise from the 'shifting-baseline' syndrome?

We should use old records and data routinely, and always refer to the earliest time for which data are available. They should use a wide range of data, not only those compatible with the model currently fashionable.

[CJA Bradshaw](#)



(with thanks to [Navjot Sodhi](#), [Barry Brook](#), [Ward Cooper](#), [Wiley-Blackwell](#) and [Daniel Pauly](#) for permission to reproduce the text – buy your copy of *Tropical Conservation Biology* [here](#))

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Cartoon of the week