

# How Useful are Australia's Official Environmental Statistics?

JENNIFER MAROHASY

**T**HE Australian Bureau of Statistics's (ABS) 2002 report *Measuring Australia's Progress* found that five of the six 'headline indicators' for the environment suggest deterioration over the last decade. Land clearance rates, dryland salinity levels and greenhouse gas emissions have all apparently increased, our inland waters are overused, and Australia's biodiversity is in decline. The only indicator that showed improvement was air quality with fine-particle pollution dropping in major cities despite an increase in motor vehicle use.

During the recent visit by Associate Professor Bjørn Lomborg, Danish statistician and author of the controversial book *The Skeptical Environmentalist*, renowned Australian environmentalist Professor Ian Lowe cited the ABS findings as evidence that economic growth in Australia is running down our natural capital.<sup>1</sup> The ABS's conclusions run contrary to Lomborg's treatise that, in developed countries, trends with respect to important environmental indicators show improvement.

In his book, Lomborg emphasizes the relevance of environmental statistics as a measure of the state of our environment, including the magnitude of the problems we face.<sup>2</sup> If the statistical trend is one of improvement, we can be confident we are 'on the right track'. If environmental statistics indicate a deteriorating situation, however, as appears to be the case in Australia, there is reason for concern and a need to re-look at 'our political aim'. Indeed, if the situation is as bad in Australia as the ABS sta-

tistics suggest, our billions of dollars worth of investment in environmental programs and the plethora of new environmental legislation and regulations introduced over the past two decades are clearly inadequate.

The ABS report begins by acknowledging that, 'it is difficult to obtain national time series data that encapsulate the changes in Australia's natural capital'. However, the report then proceeds to present graphs with trend lines suggesting that relevant facts have been systematically collected. Yet with reference to the first indicator, biodiversity, the report states that its use of numbers of species listed as vulnerable and endangered under federal legislation as a measure of biodiversity may *not* be reliable. The report then concludes, however, that declining biodiversity is nevertheless a reasonable conclusion because, 'many experts ... believe that total Australian biodiversity declined during the 1990s'. Apparently the ABS will use opinion as a substitute for measured statistics.

An increase in land clearance rates is provided as further support for the claim that biodiversity is declining. But what if the area of new native forests is greater than the area cleared? Statistics can be misleading if an analysis appears more scientific than it really is, or if an indicator provides a spurious correlation or the comparison is not really valid.

In this article, I critically evaluate the evidence used by the ABS in its 2002 report *Measuring Australia's Progress* to conclude that Australia's biodiversity is in decline.

## **BIODIVERSITY**

The ABS conclusion that Australia's biodiversity is declining is based on the total number of birds and mammals listed as extinct, endangered and vulnerable in schedules to the Commonwealth's *Endangered Species Protection Act 1993* and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC) for each year from 1993 to 2001. In fact, no new species were listed as extinct. Almost 80 per cent of the increase can be attributable to species being listed as *vulnerable* under the EPBC Act.

According to the Act, species can be listed as vulnerable if there has been a substantial reduction in its numbers and its geographic distribution is limited. The reduction in population numbers, however, could have occurred decades ago with population numbers now stable or potentially increasing.<sup>3</sup> As a consequence, new listings do not necessarily give an indication of current trends with respect to biodiversity.

A significant scientific literature recognizes that threatened species listings are not a good measure of biodiversity change and advises against the use of such lists in state of the environment reporting.<sup>4</sup>

Any person may nominate a native plant or animal species for listing under the EPBC Act, with over 311 species nominated over the last two years.<sup>5</sup> Indeed, nominating a species is an integral part of many environmental campaigns. Successful nominations normally secure significant State and Federal government funding for the development of associated Recovery Plans.<sup>6</sup>

No species extinctions have been recorded in Australia over the last two decades. Several species have been rediscovered, including the mahogany glider. If the ABS had chosen to compare the number of known extinctions to the number of rediscoveries or, for example, reported on the increase in area of conservation reserve set aside for biodiversity protection, then the report might have concluded that biodiversity in Australia is actually increasing.

## LAND CLEARANCE

Land clearance is the second environmental 'headline indicator' in the ABS report. The report's main conclusion is that 'Land clearing continues to have a major impact on our biodiversity, soil and water. Since the mid-1990s, the rate of land clearance has increased. Estimates indicate that about 470,000 hectares of land were cleared in 1999, around 90 per cent in Queensland.' The ABS, however, does not place the 470,000 hectares in any context relative to the land mass of Australia, the area planted to new forests, and the area of trees naturally thickening and regenerating. Instead, the ABS report describes the area cleared in terms of numbers of football fields, attributes the clearing to agriculture, and laments the number of birds which it estimates permanently lose their habitat as a consequence of the clearing.

Interestingly, the 2002 ABS report only presents data up to 1999 for land clearance. The omission of the 1999 to 2001 data has the effect of excluding data which show an approximate 50 per cent reduction in land clearance in Queensland from 1999 to 2001.<sup>7</sup>

The national clearing rate in the ABS report of 470,000 hectares in 1999, while not trivial, actually represents less than 0.2 per cent of the land area of Queensland and less than 0.06 per cent of the land area of Australia. According to *Australia's State of the Forests Report 2003*, 638,000 hectares were planted to

hardwood in 2002, mostly on land that was once used for agriculture.

It is interesting to compare the ABS conclusion that '40 per cent more land (135,000 hectares) was cleared in 1999 than in 1991' with *Australia's State of the Forests Report 2003* conclusion that 240,000 hectares were cleared in 1998—a reduction on the area cleared in 1988 of 546,000 hectares.<sup>8</sup> The difference in area cleared between the two reports relates, at least in part, to differences in definitions of 'forest' and 'vegetation' used by the two different Federal government departments.

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The 2003 forest report actually shows an increase of 7 million hectares of forest cover in Australia, but suggests that the increase does not represent a real increase in forest cover but rather an improvement in forest mapping. It has been argued that there is actually ambiguity and discrepancy with respect to 31 million hectares of forest cover between the 1998 and 2003 forest reports.<sup>9</sup>

Most of the land clearance reported in the ABS report is associated with cattle grazing in

Queensland—an activity occurring over approximately 50 million hectares of rangeland. Studies indicate that at the time of European settlement many of these rangeland areas were not climax (that is, in a mature state) but rather were a fire-mediated sub-climax developed over 5,000 years of Aboriginal burning.<sup>10</sup> In the absence of fire and with increased grazing pressure, there has been a general and rapid vegetation thickening, resulting in many more trees per hectare now than there were 150 years ago.<sup>11</sup>

Worldwide, vegetation thickening is an issue in rangelands with potentially significantly impacts on biodiversity, carbon and water balances.<sup>12</sup> Queensland satellite data show that 26 per cent of all clearing in 2000–2001 was of land that had no trees in 1991.<sup>13</sup> In Texas (USA), landholders are encouraged to clear trees to improve water supplies.<sup>14</sup>

Land clearance can potentially increase biodiversity in a situation where vegetation thickening threatens native grasslands. Indeed, grassland animals have evolved with adaptations<sup>15</sup> including reaction times and escape speeds suited to a treeless environment. The shorter spacing between trees in woodlands and thickening woodland can make them easy prey. When all this is considered, linking an increase in land clearance with a decrease in biodiversity is highly misleading.

## IN CONCLUSION

The ABS purports to 'assist and encourage informed decision-making, research and discussion within governments and the community, by providing a high quality, objective and responsive national statistical service'.<sup>16</sup>

The first two 'headline indicators' in its much quoted *Measuring Australia's Progress* report are concerned with biodiversity. An increase in the numbers of species listed under the EPBC Act, and an apparent increase in land clearance rates in Queensland, are purported to indicate that

Australia's biodiversity is in decline. However, the analysis lacks rigour and objectivity.

The listing of species under the EPBC Act may be driven by new knowledge and the number of successful environmental campaigns, rather than any recent change in the abundance or distribution of species. New knowledge and successful environmental campaigns are generally considered good for biodiversity protection. On this basis, it could be concluded that an increase in the number of species listed is a positive rather than a negative for Australia's biodiversity. That no new species have been recorded as extinct over the last decade needs to be acknowledged.

Choice of 'land clearance' as a headline indicator, rather than, for example, 'total native vegetation cover' or 'total forest cover', potentially has the effect of reinforcing the perception of declining biodiversity and is misleading. Given that large areas of forest have been replanted and given the phenomenon of vegetation thickening, it is likely that there are now more trees across Australia than there were a decade ago. However, biodiversity is a measure of species diversity rather than numbers of trees. Given that grasslands represent diverse ecological communities that are being lost in the arid and semi-arid rangelands as a consequence of vegetation thickening, and in wetter areas to rainforest,<sup>17</sup> Australia's biodiversity may be in decline in these regions.

In order to understand these issues and implement appropriate management strategies, we need useful environmental statistics. Rather than providing objective and quality information to facilitate informed decision-making—with respect to at least two of the six indicators in the often quoted ABS report—the ABS has provided only a superficial and popular presentation that includes conclusions based more on opinion than rigorous analysis. This information has then been used by environ-

mental advocates to reinforce perceptions that may have no basis in fact. At risk is Australia's potential to make rational decisions on important environmental issues.

## NOTES

- 1 Ian Lowe, 'The sky really is falling in after all', *Courier-Mail*, 2 October 2003.
- 2 Bjørn Lomborg, *The Skeptical Environmentalist*, Cambridge University Press, 2001, page 5.
- 3 As an example, Murray Cod was recently listed as vulnerable under the EPBC Act, even though numbers have been stable in NSW since 1964 and gradually increasing in South Australia, see <http://www.ea.gov.au/biodiversity/threatened/species/m-peelii-peelii.htm>.
- 4 Possingham, H.P., S.J. Andelman, M.A. Burgman, R.A. Medellin, L. L. Master and D. A. Keith, 'Limits to the use of threatened species lists', *Trends in Ecology and Evolution*, 2002, 17:11, pages 503–507.
- 5 See <http://www.ea.gov.au/biodiversity/threatened/nominations/index.html>
- 6 See <http://www.ea.gov.au/biodiversity/threatened/recovery/index.html>
- 7 See <http://www.nrm.qld.gov.au/slats/report.html#9901veg>.
- 8 *Ibid.*
- 9 See, in particular, submissions 207 and 208 at: <http://www.pc.gov.au/inquiry/nativevegetation/subs/sublist.html>
- 10 Neldner V.J., Fensham, R.J., Clarkson, J.R. and J.P. Stanton, 'The natural grasslands of Cape York Peninsula, Australia. Description, distribution and conservation status', *Biological Conservation*, 1997, 81, pages 121–136; Burrows, B., 'Tree clearing—rehabilitation or development on grazing land?' *IV International Rangelands Conference*, 1999, Townsville, Australia.
- 11 Fensham, R.J. and S.D. Skull, 'Before cattle: A comparative floristic study of Eucalyptus savanna grazed by macropods and cattle in North Queensland, Australia', *Biotropica*, 1999, 31, pages 37–47; Fensham, R.J., 'The influence of cattle grazing on tree mortality after drought in savanna woodland in North Queensland', *Australian Journal of Ecology*, 1998, 23, pages 405–407; Fensham, R.J., 'Resolving biomass fluxes in Queensland woodlands', *Climate Change Newsletter*, 1998, 10, pages 13–16.
- 12 Wilcox, B.P & U.P. Kreuter, 'Woody Plant: Stream flow interactions as a basis for land management decisions in drylands', *Proceedings of the 7th International Rangelands Congress*, 2003, South Africa; Van Auken, O.W., 'Shrub Invasion of North American semiarid grasslands', *Annual Review of Ecology and Systematics*, 2000, 31, pages 197–215.
- 13 Queensland Department of Natural Resources and Mines, *Land Cover Changes in Queensland 1999-2001*, January 2003, page 26, Table 6. <http://www.nrm.qld.gov.au/slats>
- 14 Wilcox, B.P & U.P. Kreuter, 'Woody plant: stream flow interactions as a basis for land management decisions in drylands', *Proceedings of the 7th International Rangelands Congress*, 2003, South Africa.
- 15 See <http://www.blackwellpublishing.com/townsend/Chapters/EOEC02.pdf>
- 16 See <http://www.abs.gov.au>
- 17 Hopkins, M.S., Head, J., Ash, J.E., Hewett, R.K., & A.W. Graham., 'Evidence of a Holocene and continuing recent expansion of lowland rainforest in humid, tropical North Queensland', *Journal of Biogeography*, 1996, 23, pages 737–745.

Dr Jennifer Marohasy is the Director of the IPA's Environmental Unit.

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