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commentary on Polak et al. ()

Woinarski, John

Link to publication

Nugatory Targets Lead to Nugatory Reserve Systems that will not Staunch Biodiversity Loss: Commentary on Polak *et al.* (2016)

John C.Z. Woinarski

Threatened Species Recovery Hub of the National Environmental Science Programme, Charles Darwin University, Darwin, NT, 0909, Australia

Correspondence
J.C.Z. Woinarski, Threatened Species Recovery
Hub of the National Environmental Science
Programme, Charles Darwin University, Darwin,
NT 0909, Australia.
Tel: 0455961000;
E-mail: john.woinarski@cdu.edu.au

Two recent articles (Polak *et al.* 2015, 2016) explore conservation planning for Australian threatened species and ecosystems, concluding that "to meet 100% of all species and ecosystem targets requires 24.4% of the total land area." There is risk in such statements that policy-makers will assume that a reserve network of such extent will ensure conservation security for all threatened species, and be adequate to maintain environmental variation. It will not. The value of the conservation outcomes that such analyses deliver is largely contingent on the ecological sense of the targets used. Responding to Polak *et al.* (2016)'s invitation, that "there is a clear need for systematic thinking around targets for species and ecosystem representation," I note some shortcomings in the targets applied in their analysis.

Both articles use two targets: 17% representation of all ecosystems and inclusion (to variable target levels) of threatened species. The former target, consistent with the UN's sustainable development goals, is without robust ecological foundations and likely to be insufficient to retain many components of biodiversity (Scott & Tear 2007). But in this case, the attribute to which the target is applied is suboptimal. Both articles equate Australia's 85 defined bioregions as ecosystems, an equivalence nowhere intended in the bioregion concept (Thackway & Cresswell 1995). Rather, Australia's long-established policy seeks to reserve the range of ecosystems *within* bioregions (Australian & New Zealand Environment and Conservation Council 1999). Bioregions contain very many distinct ecosystems; e.g., >1,000 ecosystems are defined in the 13 Queensland bioregions (Sattler & Williams 1999). A network designed simply to represent bioregions will leave very many ecosystems unreserved.

The Polak *et al.* articles also claim that their design will meet targets for "all [threatened] species." However, many (several hundreds) of Australia's ca. 1,800 listed threatened species were omitted from their analyses, including freshwater and migratory species, those "whose distributions are only estimated with low certainty," and those now occurring mostly in largely modified environments. Second, modeled distributions were used. Nominal protected areas that represent modeled distributions may well not actually have those species, especially so where ranges are contracting rapidly, as for many Australian species (Woinarski *et al.* 2014). Third, Australia's formal list of threatened species represents only a subset of the actual number of species at risk of extinction. It has major deficiencies, particularly for invertebrates. Even among well-known groups, it is incomplete: for example, of 133 Australian mammals that meet International Union for the Conservation of Nature (IUCN) criteria as threatened, 44 are not included in Australia's

threatened species list (Woinarski *et al.* 2014). Fourth, for many (ca. 150) threatened species, the reservation target was for only 10% of their distribution. It is highly unlikely that this nugatory level (i.e., up to 90% of the current distribution left outside reserves) will be adequate to prevent extinction and improve and sustain their status.

The Polak *et al.* (2016) design meets arbitrary targets for representation of bioregions. But, it will fail to provide *any* reservation for many Australian ecosystems and many threatened species, and will provide inadequate reservation—and hence inadequate conservation security—for many other threatened species.

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