

Senate Standing Committees on Environment and Communications

Australia's extinction crisis

Submission on Christmas Island issues from [Professor John Woinarski](#), Charles Darwin University

This submission provides a brief review of some issues relating to extinction on Christmas Island. To some extent, Christmas Island provides an acute exemplar of the extinction crisis affecting Australian biodiversity more broadly.

The example of Christmas Island is highly pertinent to the Senate Standing Committee's focus, as two of the most recently documented Australian extinctions (the Christmas Island pipistrelle and Christmas Island forest skink) were endemic to Christmas Island (Woinarski 2018). The recency of these extinctions (26 August 2009 and 31 May 2014, respectively) demonstrates that Australia's current conservation settings (including national legislation and investment) is inadequate.

As a global characteristic, oceanic islands (i.e., those with no history of connection to continental land masses) have many endemic species, and thus contribute disproportionately (relative to their area) to the world's biodiversity. However, island species are also highly susceptible to extinction, and a disproportionately large number of extinctions (in Australia and the world) are of island species. This is in part because island endemic species have small population size, limited genetic diversity, and reduced capability to cope with introduced predators, diseases or competitors.

This tendency is well exemplified by Christmas Island. Four of the island's five native mammal species occurred only on (were endemic to) Christmas Island: the fifth (Christmas Island flying-fox) is an endemic subspecies. However, at least three of these five mammal species (Christmas Island pipistrelle, Maclear's rat and bulldog rat) have become extinct since the island's settlement (in the 1880s); and a fourth (the Christmas Island shrew – Australia's only shrew) is probably extinct (with no records since 1985).

Likewise, of Christmas Island's original assemblage of six native reptile species, five were endemic. However, over the last 20 years, one species (the Christmas Island forest skink) has become extinct, the population of the native but non-endemic coastal skink has been extirpated, and two other endemic lizard species (Lister's gecko and the blue-tailed skink) are now extinct in the wild and persist only as a captive breeding population with some recent trial reintroductions to enclosures on Christmas Island and as translocations to small islands in the Cocos (Keeling) group. The now extinct Christmas Island lizards were also of great antiquity, having diverged from ancestral stock 5 to 23 million years ago: an exceptional amount of evolutionary history was lost with these extinctions (Oliver *et al.* 2018).

We have previously reviewed the range of legislative, funding and management shortcomings that allowed – or were inadequate to prevent – these recent extinctions (Woinarski *et al.* 2017). In part, these shortcomings included (i) that the national legislation and relevant strategies (e.g., Natural Resource Management Ministerial Council 2010) provided no strong and explicit commitment to preventing extinction; (ii) recovery plans and other conservation efforts were insufficiently resourced; (iii) listing of species as threatened is unsystematic and lacked urgency – notably, notwithstanding evidence over many years of drastic and fatal declines in Christmas Island forest

skink, the species was not listed as threatened until after the year of the last recording of an individual in the wild: listing came too late. In part to address these shortcomings and learn from these losses, we recommended an inquest or public inquiry should be held after any extinction event (Woinarski *et al.* 2017).

The number of extinctions of species on Christmas Island is likely to be far greater than those documented for mammals and reptiles. This is likely to be particularly so for Christmas Island's rich assemblage of invertebrate species. A recent review of all endemic species on Christmas Island concluded that about 50 endemic invertebrate species had not been reported for at least 100 years (James *et al.* 2019). Most of these are likely to be extinct, but none are recognised as such, and very few Christmas Island invertebrate species are even listed as threatened. Hence, the extinction rate on the island is likely to have been vastly under-recognised and under-reported. This is likely to be the case also for many other Australian islands, and for Australian invertebrates generally. There are marked taxonomic biases in the recognition and listing of Australia's biota as threatened and extinct (Walsh *et al.* 2013), with far more focus and conservation investment given to mammals and birds than to other taxonomic groups. For the more poorly known and neglected groups, this is a vicious cycle: because there is little public interest in invertebrates and relatively few invertebrate researchers, there is little monitoring of them and hence too little evidence of their decline to list the species as threatened; and not being listed, these largely neglected species are afforded no conservation investment, and are not considered in development applications or strategic assessments (such as that currently underway on Christmas Island) that could substantially further subvert their status: as such they continue to decline, with such losses largely un-noticed. Much greater precautionary protection (in legislation, investment and management practice) needs to be directed towards such poorly known potentially imperiled species.

It is likely that many Christmas Island invertebrate species would qualify as threatened, but are not listed as threatened because the evidence base is too sparse and there has been insufficient attempt to build that evidence base. Some of these species – imperiled, but not formally listed as threatened – may need urgent conservation attention to stave off extinction.

The basic cause of all of the many Christmas Island extinctions is inadequate biosecurity, which has resulted in the deliberate or inadvertent introduction of invasive species, and the unwillingness or incapacity of relevant authorities to eradicate such invasive species once they have become established.

Recommendations

The following recommendations apply to Christmas Island specifically, but may also relate to Australia's islands generally.

- 1: Island endemic species have particular susceptibility to extinction. In order to reduce the future extinction rate of Australia's biota, the conservation of island endemic species should be recognised as a strategic national priority.
- 2: The relevant legislative and regulatory basis for biosecurity should be strengthened to increase protection of biodiversity on Australia's island estates, and resourcing for such biosecurity increased to recognise this important responsibility.
- 3: A well-resourced program to resolve the conservation status (including whether extinct or extant) of island endemic invertebrates should be implemented; with results of such surveys used to

formally assess the conservation status of species, list as threatened those that qualify for such status, and to implement the conservation management required to prevent extinction. Such a targeted program would help to redress the conservation bias against Australia's invertebrate species.

4: Strategic assessments are likely to be deeply flawed and to provide no explicit protection for imperiled species that are not yet formally recognised as threatened simply because the evidence base is too sparse. The legislative and regulatory basis for any such strategic assessment should be amended to consider such potentially threatened species as a precautionary measure in strategic assessments or environmental impact statements, and to allow for appropriate changes in plans if and when the formal listing of such species is made subsequent to the initial plan.

5: Two Christmas Island reptile species (Lister's gecko, blue-tailed skink) are now Extinct in the Wild. These species are now dependent upon a conservation management program that has as yet no long-term security. Without a long-term commitment to their ongoing conservation management, these species are likely to become extinct. A long-term (20+ years) commitment is required for these species.

6: Intensive, long-term and strategic management efforts should be made to eradicate key invasive species from islands. This will be a cost-efficient mechanism that may go a long way towards reducing the rate of future extinctions. Notably, there have been some exemplary recent successes in such eradications (e.g., cats, rabbits and rodents on Macquarie Island; cays on Dirk Hartog Island; and rodents on Lord Howe Island), and these have brought substantial conservation benefits (Springer 2018; Algar *et al.* 2020).

7: The conservation value of Christmas Island is exceptional by global standards, but its conservation challenges are daunting. The values merit listing of the island as a World Heritage site, and a nomination for such listing should be urgently implemented. Such listing will not by itself prevent extinction, but it will provide more scrutiny of the status and condition of the island's biodiversity, and more support for its conservation – thereby diminishing the likelihood of extinction for its many recognised and unrecognized threatened species.

References

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