Import risk review for psittacine birds from all countries

Submission by the Invasive Species Council

September 2020

Document details

Invasive Species Council. 2020. *Import risk review for psittacine birds from all countries. A submission by the Invasive Species Council*. September 2020.

About the Invasive Species Council

The Invasive Species Council was formed in 2002 to advocate for stronger laws, policies and programs to keep Australian biodiversity safe from weeds, feral animals, exotic pathogens and other invaders. It is a not-for-profit charitable organisation with over 3000 supporters, funded predominantly by donations from supporters and philanthropic organisations.

Intellectual property rights

Inquiries

Invasive Species Council
Address: PO Box 96, Katoomba NSW 2780, Australia
ABN: 27 101 522 829
Web: invasives.org.au
Email: isc@invasives.org.au

Contents

1. Introduction

The Invasive Species Council considers the *Import risk review for psittacine birds from all countries* highly inadequate because:

- the risk assessments downplay the potentially very serious consequences of diseases for Australia's parrots and cockatoos, particularly threatened species, and the overall risks
- the proposed biosecurity measures are insufficient to reduce the risks of new diseases entering Australia to 'very low' consistent with Australia's ALOP
- the review overlooks the risks of some pathogens or new pathogen genotypes that could be introduced to Australia with imported parrots and cockatoos.

At stake are extremely high conservation values – Australia is a conservation hotspot for parrots and cockatoos, with many threatened species [1]. Twenty taxa were assessed under *The Action Plan for Australian Birds 2010* as threatened or near threatened [2]. The introduction of pathogens can have catastrophic impacts on wildlife, as exemplified by the extinction of several frog species in Australia due to chytrid fungus (*Batrachochytrium dendrobatidis*), the extinction of several bird species in Hawaii due to malaria parasite (*Plasmodium relictum*), severe declines in microbats in the United States due to white nose syndrome fungus (Pseudogymnoascus destructans) and severe declines in Australian plants due to *Phytophthora cinnamomi* and myrtle rust (*Austropuccinia psidii*).

We strongly recommend that the current ban on importing psittacine birds remains in place. The 1995 ban was imposed due to an inability to properly determine and address the risks. This remains the case.

2. Underrated risks for native parrots and biodiversity

The risk assessments in the review are highly inadequate in their ratings for the potential effects of introducing new diseases or new pathogen genotopes that could infect Australia's native parrot and cockatoo species. Australia is a global centre of Psittaciformes diversity and endemism, and 12 taxa were assessed under *The Action Plan for Australian Birds 2010* as endangered or critically endangered. A new or modified disease could be catastrophic, particularly for threatened species such as the orange-bellied parrot. The consequences have been seriously downplayed in the risk assessments. A value judgement seems to have been applied to all risk assessments rating the direct effects on the life or health of psittacine birds as of 'minor significance'. There also appear to be contradictions between the information provided about likely impacts and the risk ratings. We offer a few examples here.

For example, the review acknowledges that all psittacine species are considered 'highly susceptible' to infection avian orthoavulavirus 1, that 'high mortalities in wild bird populations are expected', that 'outbreak in wild birds may cause a reduction in biodiversity' and yet the effect is rated as of 'minor significance at the national level' for susceptible wildlife and the environment. In contrast, the community effects of an outbreak in commercial poultry are rated as 'significant at the national level', even though there is a vaccine for the virus and the impacts on industry would be transient. No justification is provided for either rating. Threatened parrot and cockatoo species are matters of national environmental significance under the *Environment Protection and Biodiversity Conservation Act 1999*, so a disease that can cause mortality in wild birds should automatically be rated as nationally significant and the risk as high to extreme (particularly for highly threatened species such as the orange-bellied parrot, which is on the verge of extinction).

Likewise, the review acknowledges that psittacine APAV-3 viruses can cause significant disease and mortality in psittacine birds, with the *Neophema* genus reported to have a high susceptibility. This genus includes the critically endangered orange-bellied parrot for which any new disease is likely to be catastrophic. Yet, the review rates the potential effects on susceptible wildlife and the environment as only of 'minor significance at the national level' and the overall effect as low.

The effect of proventricular dilatation disease was rightly rated as of 'significance at the national level', but even though the review acknowledges that many native Australian parrot species are likely to be susceptible and that it is one of the greatest threats to endangered psittacine species, the likely consequences are still rated as 'moderate' and the overall risk is assessed as 'low' due to the likelihood of entry and exposure being assessed as 'low'. The latter rating is too low given the widespread distribution of the disease and the potential for incubation to last for years and clinical signs to be absent.

The review says that bornavirus 'does not appear to be highly contagious'. Nonetheless, infection is 'prevalent' in captive parrots [3] and evidence for 'natural, long-term ABV infection' has been found in wild parrots, with 40 of 86 parrots (47%) tested in Brazil having signs of the infection or disease or both [4]. A 2020 review noted only one other (unpublished) test of wild parrot populations [3], but bornavirus infections in other wild bird populations (eg swans, geese and ducks in North America) appear to be 'relatively common' [5–7].

The review claims 'High mortalities in wild birds are not expected' but does not justify this (and acknowledges it cannot be discounted). Given the likely high susceptibility of many Australian parrots to the disease and that bornavirus infections in wild bird populations can be quite common,

it is rash and unjustified to claim that high mortalities would not be expected in naïve Australian parrot populations. Even low mortalities in highly threatened parrot species can be a major threat.

Recommendation

Revise the risk assessments, particularly the consequence ratings, to more accurately reflect the potentially catastrophic impacts of a new pathogen or new pathogen genotype on Australia's native parrots and cockatoos, particularly the many threatened taxa, which are of recognised national significance under the EPBC Act.

3. Inadequacy of proposed measures

The proposed biosecurity measures for the pathogens identified as risks rely on pre-export and post-entry quarantine with testing for particular pathogens. Based on the information provided, this is inadequate to detect all known diseases with a high level of confidence (which is needed to meet the 'very low risk' threshold of Australia's ALOP).

For example, with parrot bornavirus, the proposed measures are quarantine pre-export for at least 7 days and post-entry for at least 15 days with repeat testing (by unspecified methods and number of tests). But the review acknowledges the incubation period may last for years and that birds may only shed the virus intermittently. The efficacy of the proposed measures relies on the birds being stressed and therefore shedding virus, an untested assumption that the review acknowledges is only a possibility – virus shedding 'may be more likely following a stressful event (such as international transport)'. It also relies on diagnostic tests being reliable. As acknowledged in the review, diagnosis is 'problematic due to the remarkable genetic variability' of the virus and 'the potential for subclinical infection to confuse diagnosis'.

The contention that the proposed measures can reduce the risk of parrot bornavirus to very low is contradicted by the scientific literature, which makes clear that current tests for diagnosing bornavirus infection are not sufficiently reliable:

> *The genetic variability as well as unidentified virus variants are major challenges to the diagnosis of bornaviruses in birds* [8].
>
> *… the present study demonstrated a considerable antigenic diversity among the Bornaviridae family, which may markedly influence the detection of anti-bornavirus antibodies. Considering the variety of bornaviruses detected since 2008, it is likely that new genotypes will continue to be identified* [9].
>
> *[We] were not able to detect PaBV-2 RNA in the blood of any of the cockatiels [experimentally infected with the virus] in this experiment, which corroborates with other studies that concluded that blood samples are not reliable for PaBV-2 detection by RT-PCR* [10].
>
> *Many infected birds remain apparently healthy for many years and during that time, PaBV may be shed intermittently in the urofeces. As a result, repeated reverse transcriptase polymerase chain reaction (RT-PCR) testing of cloacal swabs has been found to be the most reliable, noninvasive method for diagnosis of infection … Because of the intermittent nature of virus shedding, a negative RT-PCR result is not indicative of being uninfected* [11].
>
> *[M]any confirmed cases of PDD have been reportedly PaVD negative with multiple tests* [3].
>
> *Reported rates of ABV-positive birds among commercial laboratories and university settings range from 3% to 33%. This may be due to intermittent shedding or because the known ABV genotypes vary in sequence identity …* [3].

Recommendation

Reject the adequacy of the proposed biosecurity measures to reduce the risk of importing parrots and cockatoos to 'very low' consistent with Australia's ALOP.

4. Unassessed disease risks

Several disease risks have not been assessed in the import risk review. We have not comprehensively reviewed the diseases removed from the review but one example of an important group of parasites that warrant risk assessment are *Haemoproteus* species, which are protozoan blood parasites that can be transmitted by biting midges (Ceratopogonidae) and louse flies (Hippoboscidae) [12]. They are closely related to *Plasmodium* species, one of which (*P. relictum*) has caused several extinctions of Hawaiian birds. *Haemoproteus* parasites are typically quite benign in natural hosts but can cause severe and fatal disease in naïve birds, including parrots. Overlooked in the review was a 2019 report of fatalities caused by the 'highly virulent' *Haemoproteus minutus* in Australian parrots in European aviaries, including Bourke's parrot, budgerigar, crimson rosella, western rosella, turquoise parrot, princess parrot and superb parrot (listed as vulnerable) [13]. The review also failed to note a 2017 paper reporting a new species in a South American macaw, *H.* (*Parahaemoproteus*) *homohandai* n. sp. [12]. There are major gaps in knowledge of this group of parasites and limited diagnostic capacity [14]. There is likely to be considerable undescribed diversity of blood parasites in parrots from South America and South Asia [12], which could constitute serious risks for naïve Australian species. No blood parasites were detected in 1200 parrots examined in Queensland [15]. The reason given in the review for not assessing the risks of blood parasites is an unjustified, unreferenced contention that it 'is highly unlikely that live bird imports would introduce a new species of haemosporidia that would become established and cause adverse effects in Australia's bird populations'.

Other diseases not assessed in the review are noted in a report by Dr Ronald Orenstein (attached to a submission by Humane Society International). These include species or genotypes not already in Australia of the following pathogens: *Chlamydia* (*Chlamydiophila*) *psittaci* and other *Chlamydia* species, Circovirus, *Encephalitozoon hellem*, *Enterococcus* species, *Escherichia coli* and *Mycobacterium genavense*. A recent global analysis found that regions of the world with imported parrots, such as Europe and the United States, may be playing a major role in accelerating genetic diversification of psittacine circovirus and that novel genotypes arising in captive bird populations could be a threat to endangered wild birds [16].

Several new disease risks have been identified only recently – suggesting that even if the review is updated to include all known risks, it will quickly become outdated due to new identified risks and that several hazards are likely to go unidentified.

Recommendation

Expand the risk review to assess the risks of *Haemoproteus* parasites as well as new genotypes of pathogens already in Australia. Commission an independent expert to comprehensively review psittacine diseases to identify all hazards that should be assessed.

5. Conclusion

The findings of this review should be rejected. The risks to Australia's parrot and cockatoos from known pathogens have not been adequately assessed and the proposed biosecurity measures are insufficient to reduce risks to 'very low'. It is not rational to claim that the risks of importing parrots and cockatoos are 'very low' when, to take just one example – bornoviruses:

- can cause fatal disease, 'considered to be one of the greatest threats to … endangered psittacine species'; 'If endangered species of parrots become affected, this may have a significant impact on the species' conservation status.'
- have been 'documented in over 80 species of parrots', and 'it is highly likely that many native Australian parrot species are susceptible to infection'
- likely 'present worldwide due to global trade of parrots'
- has unknown 'routes of infection and transmission'; 'may involve horizontal and vertical routes'
- the 'incubation period is highly variable' and 'may range from a few weeks to many years'
- can be carried by birds with no clinical signs; these 'may shed the virus for years and shedding may occur continuously, intermittently or rarely'
- cannot be reliably diagnosed: 'diagnosis in live birds is problematic' – due to 'remarkable genetic variability', 'challenge in developing reliable diagnostic tests', 'potential for subclinical infection to confuse diagnosis'; diagnosis in intermittently shedding birds relies on an untested assumption that the stress of travel will trigger virus shedding.

Recommendation

Maintain the ban on imports of parrots and cockatoos to Australia on the basis of unacceptable risks to native species, particularly threatened species, insufficient knowledge of disease risks and insufficient capacity to diagnose all serious diseases.

6. References

1. Vergara-Tabares DL, Cordier JM, Landi MA, et al. (2020) Global trends of habitat destruction and consequences for parrot conservation. *Glob Change Biol* 26: 4251–4262.
2. Garnett S, Szabo J, Dutson G (2011) The Action Plan for Australian Birds 2010, CSIRO Publishing.
3. Hoppes SM, Shivaprasad H (2020) Update on avian bornavirus and proventricular dilatation disease, *New and Emerging Diseases: An Update*, Elsevier, 337–352.
4. Encinas-Nagel N, Enderlein D, Piepenbring A, et al. (2014) Avian bornavirus in free-ranging psittacine birds, Brazil. *Emerg Infect Dis* 20: 2103–2106.
5. Delnatte P, Berkvens C, Kummrow M, et al. (2011) New genotype of avian bornavirus in wild geese and trumpeter swans in Canada. *Vet Rec* 169: 108–108.
6. Guo J, Covaleda L, Heatley JJ, et al. (2012) Widespread avian bornavirus infection in mute swans in the Northeast United States. *Vet Med Res Rep* 3: 49–52.
7. Guo J, Shivaprasad H, Rech RR, et al. (2014) Characterization of a new genotype of avian bornavirus from wild ducks. *Virol J* 11: 197.
8. Philadelpho NA, Rubbenstroth D, Guimarães MB, et al. (2014) Survey of bornaviruses in pet psittacines in Brazil reveals a novel parrot bornavirus. *Vet Microbiol* 174: 584–590.
9. Zimmermann V, Rinder M, Kaspers B, et al. (2014) Impact of antigenic diversity on laboratory diagnosis of Avian bornavirus infections in birds. *J Vet Diagn Invest* 26: 769–777.
10. Leal de Araujo J, Rech RR, Heatley JJ, et al. (2017) From nerves to brain to gastrointestinal tract: A time-based study of parrot bornavirus 2 (PaBV-2) pathogenesis in cockatiels (Nymphicus hollandicus). *PloS One* 12: e0187797.
11. Murray O, Turner D, Streeter K, et al. (2017) Apparent resolution of parrot bornavirus infection in cockatiels (Nymphicus hollandicus). *Vet Med Res Rep* 8: 31.
12. Valkiūnas G, Pendl H, Olias P (2017) New Haemoproteus parasite of parrots, with remarks on the virulence of haemoproteids in naive avian hosts. *Acta Trop* 176: 256–262.
13. Ortiz-Catedral L, Brunton D, Stidworthy MF, et al. (2019) Haemoproteus minutus is highly virulent for Australasian and South American parrots. *Parasit Vectors* 12: 1–10.
14. Valkiūnas G, Ilgūnas M, Bukauskaitė D, et al. (2019) Molecular characterization of six widespread avian haemoproteids, with description of three new Haemoproteus species. *Acta Trop* 197: 105051.
15. Peirce M, Lederer R, Adlard R, et al. (2004) Pathology associated with endogenous development of haematozoa in birds from southeast Queensland. *Avian Pathol* 33: 445–450.
16. Harkins GW, Martin DP, Christoffels A, et al. (2014) Towards inferring the global movement of beak and feather disease virus. *Virology* 450: 24–33.