CASE STUDY: SMOOTH NEWT

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A case study of the establishment of a new amphibian in Victoria and a failure to proceed with eradication.

Skin secretions produced by smooth newts could prove deadly to native birds in Melbourne's suburbs. Photo: John Beniston (CC BY-SA 3.0)

Species

Smooth newt (*Lissotriton vulgaris*).

Origin

Europe and western Asia.

Australian occurrence

First detected in Melbourne in June 2011. Found at six sites in 2012 and six sites in 2013, including four of the 2012 sites.[1] The extent of its establishment is unknown.

Potential ecological impacts[2]

The smooth newt is the only salamander in the wild in Australia (the only member of an entire amphibian order) and the first invasive population of this species in the southern hemisphere, so it is hard to predict likely impacts. Tingley et al. (2014) note that 'On average, exotic species with only distant relatives in their invaded ranges tend to have greater impacts' because the native species probably lack co-evolved defences against them.

The smooth newt is able to live in a wide range of habitats, and climate matching suggests that large parts of NSW, Victoria, eastern Tasmania, southern South Australia, and south-western Western Australia are particularly suitable for it.

Potential impacts could arise from predation, competition, toxicity and disease spread. The smooth newt is a generalist carnivore, eating invertebrates, crustaceans, and frog and fish eggs and larvae. It may compete with or prey on a wide range of native land and freshwater species.

There is a risk that smooth newts could poison their predators (like cane toads do). Some salamanders produce a neurotoxin (tetrodotoxin) on their skin. Tests have previously shown that the European smooth newt has low levels or no tetrodotoxin but because Australian predators 'have no evolutionary history of exposure to tetrodotoxin … the effect of even low doses of this toxin on Australian frog-eating predators remains unclear.' If the toxin is potent, it could affect a wide range of potential predators (invertebrates, wading birds, snakes, lizards, turtles and mammals which prey on species occupying similar environments or are morphologically similar).

A close relative of the smooth newt carries chytrid fungus, which has caused extinctions and declines in Australian frogs, so there is a risk that smooth newts will spread the disease.

Pathways

The most likely pathway for establishment is deliberate release or escape from illegal pet keeping. The keeping of smooth newts is prohibited Australia-wide but it used to be allowed. Another possibility is it arrived as a stowaway with cargo or in a container.[3]

BIOSECURITY ISSUES

Summary

ISC's view is that governments have not taken the potential environmental impacts of the smooth newt seriously enough. Decision-making was exceedingly slow, with a decision by the National Management Group to not attempt eradication taken at least 22 months after detection, allowing the newt to spread and making eradication much more difficult (perhaps impossible) and costly. The precautionary principle was ignored and the decision-making lacked transparency and had limited input from independent experts on ecology and amphibians. This case particularly highlights the lack of precaution applied in decisions about whether to eradicate. Because the smooth newt has not established invasive populations in the southern hemisphere and there are no salamanders in Australia, there are high levels of uncertainty about the likely impact. This uncertainty should have resulted in a higher risk rating and more strongly favoured a decision to attempt eradication. By the time its impacts become apparent it will be far too late to eradicate the smooth newt. A decision on whether to eradicate the smooth newt should be revisited.

Ecology Australia's Katie Stevenson in search of the smooth newt in Melbourne.
Photo: Andrew Cox

Emergency response

The smooth newt was discovered in an outer suburb of Melbourne in June 2011. A trapping survey in June-November 2011 found it at four locations. Surveys in 2012 found it at additional locations, suggesting it had spread.

Sometime in 2012 the incursion was referred by the Victorian government to a Consultative Committee for a decision under the National Environmental Biosecurity Response Agreement (NEBRA) on whether it would be eradicated with national cost-sharing. An FOI request for all National Management Group meeting agendas for 2012 showed no evidence that the smooth newt was discussed at that level.

In January 2013 the Australian Bureau of Agricultural and Resource Economics and Science (ABARES) completed a 'national significance assessment', as required under NEBRA.[4] The expertise of the authors of this assessment and the extent to which they consulted with experts are unknown. However, the references suggest the assessment was based solely on published literature. Given the limited extent of the literature, particularly with respect to Australia, which has no salamanders, this seems inadequate. The ABARES assessment 'did not identify any likely severe and/or extensive impact'. However, it acknowledged that the impact on Australian biodiversity, particularly frogs and reptiles is 'somewhat uncertain'. In ISC's view this downplays the extent of uncertainty (contrasting with the analysis of Tingley et al. 2014, who emphasise the unknowns arising from the lack of evolutionary history of salamanders in Australia). The assessment also dismissed the potential for the newt to be toxic to predators (in contrast to Tingley et al 2014, who warn that its effects could differ on Australian species due to their lack of evolutionary exposure to the toxin).

On 16 April 2013 the Victorian Department of Primary Industries completed a NEBRA Preliminary Technical Feasibility Analysis, which concluded that the technical feasibility of eradication was 'moderate' or 'low to moderate' depending on how criteria were weighted (but with many unknowns).[5] We do not know how valid the conclusion is, although clearly the almost two years of inaction since detection, allowing the newt to spread, had by this date greatly undermined the potential for eradication. Such assessments would engender more confidence if they were subject to peer review by independent experts. The NEBRA feasibility assessment shows that the criteria need refinement (better definition and weightings).

On a date unknown, at least 22 months

OUR MISSION

To protect the environment from harmful new invasive species through prevention and early action.

Stronger biosecurity is vital to protect the highly endemic wildlife of Australia and its many special wild places. This is Lord Howe Island, where invasive species have already caused several extinctions.
Photo: Robert Whyte

after the newt was detected, a decision was made to not attempt a cost-shared eradication of the smooth newt. Due to a lack of transparency the reasons for not proceeding are unknown. . As far as we are aware, the decision-making process did not involve ecological or amphibian experts.

In 2016, the Invasive Species Council with pro-bono support from Ecology Australia conducted its own survey. It found that the smooth newt still persists and is breeding in a number of the original sites. We recommend the decision on eradication of the smooth newt be revisited, after a comprehensive survey of the original detection and nearby sites, and with advice from an environmental scientific panel on the significance of the newt impacts and the feasibility of eradication.

A smooth newt found in Melbourne's waterways.

Treatment of uncertainty

By deciding not to eradicate the smooth newt, Australian governments have in effect decided to proceed with the experiment of allowing a new order of amphibians to establish and spread in Australia. This is despite high levels of uncertainty about its impacts – due to the lack of salamanders in Australia and the lack of invasive populations elsewhere in the world. As Tingley et al. (2014) point out, invasive species impacts are on average more severe when there is a large phylogenetic distance between the invader and native species because there has been no evolutionary opportunity for native species to evolve defences. Despite the precautionary principle being fundamental to environmental decision-making (and required for decisions under the national environmental law), there is no mention of the precautionary principle in NEBRA or other biosecurity policies.

Community engagement

During the first year of the incursion the Victorian government tried to keep it secret to avoid revealing the location of the newt. This was to prevent people from collecting it and exacerbating the risk. ISC respected the request for secrecy, but this limited the opportunity for the community to influence decision-making. In hindsight, given the poor decision-making, it may be better to allow public scrutiny than to keep new outbreaks secret.

There has been no information published about the decision-making regarding the smooth newt. ISC obtained some documents after applying for them through FOI. We are gravely concerned that the secrecy of decision-making under NEBRA and the other agreements undermines the quality of decision-making and encourages governments to prioritise short-term financial considerations over the longer-term public interest in environmental protection.

Enforcement

The smooth newt incursion raises questions about the extent of investigation of illegal pet keeping and trading and the resources invested in enforcing prohibitions. Do compliance officers properly monitor illegal pet-keeping and trade? We suspect not. There was one seizure in Melbourne in 2004 reported in the media.[6]

CHANGES NEEDED

Decision not to eradicate

- There should be reconsideration of the decision not to eradicate the smooth newt, with an independent peer-reviewed assessment of significance and feasibility.

Decision-making processes

- Improvements are urgently needed to decision-making about eradications – to ensure that decisions are made quickly, are based on evidence, involve consultation with experts and are transparent, with decisions reported publicly and all documents made available online.

Ecological expertise

- Assessments of national significance and feasibility under NEBRA should be done by independent ecological experts (or at least reviewed by independent experts) and relevant experts should be consulted on potential impacts and the potential for eradication.

Precautionary principle

- The precautionary principle should be applied in decision-making under emergency response arrangements for invasive species that may harm the environment.

Enforcement

- Work is needed to:
  - determine the likely sources of the smooth newts now established in the wild;
  - analyse the environmental risks associated with the illegal pet trade and illegal pet-keeping in Australia;
  - Identify other amphibian species being kept illegally
  - develop national and state enforcement and compliance strategies for illegal pet keeping.

ABOUT OUR CASE STUDIES

Our case studies illustrate the need for changes in how Australia prevents the establishment of new invasive species. They were compiled using publicly available information at the time of the last update. We would welcome new information or updates to biosecurity response for inclusion in future updates.

CONTACT US

- Visit invasives.org.au for more information about the Invasive Species Council and to get in touch.

REFERENCES

Parsons S, ten Have J. 2013. NEBRA National Significance Assessment for the Smooth newt (Lissotriton vulgaris). Assessment by the Australian Bureau of Agricultural and Resource Economics and Sciences. January 2013.

Tingley R, Weeks A, Smart A, van Rooyen A, Woolnough A, McCarthy M. 2014. European newts establish in Australia, marking the arrival of a new amphibian order. Biological Invasions, DOI: 10.1007/s10530-014-0716-z.

Victorian Department of Primary Industries. 2013. NEBRA Preliminary Technical Feasibility Analysis: Smooth Newt (Lissotriton vulgaris).

ENDNOTES

1 Tingley et al. (2014)

2 Most of this information has come from Tingley et al. (2014)

3 Grgurinovic et al.(2006) detected viable spores on a wood shipment to Australia from South America

4 Parsons & ten Have (2013).

5 Victorian Department of Primary Industries (2013).

6 http://www.abc.net.au/news/2004-10-14/exotic-newts-seized-from-melbourne-house/568564