

Science for Saving Species

Research findings factsheet

Project 6.3.6



National Environmental Science Programme

Last chances for urban-restricted threatened species: Correcting common misconceptions about conservation for urban environments

In brief

Urban areas often coincide with the range of threatened species and ecosystems of conservation concern. Securing land for conservation may be a luxury that is only possible for a few urban species, so alternative approaches must be embraced in order to prevent extinctions.

Existing green spaces are under increasing pressure from urbanisation, and the conservation potential of many small habitat remnants and urban environments are often poorly understood and under-

utilised. In addition, perceptions that undervalue urban environments further undermine opportunities for conservation. However, conserving native biodiversity is both important and achievable in Australian cities and towns.

We identified 39 nationally listed threatened species with ranges that coincide with just one or two cities or towns, and identified conservation actions that can help these populations of species to persist in their heavily modified urban habitats.

We also recommend four principles to guide conservation action in urban environments: (1) consider small spaces for conservation action; (2) recognise the value of unconventional habitats; (3) test creative solutions; and (4) use science to minimise the impacts of future urban development.

Overcoming the misconceptions that constrain conservation action for biodiversity in urban environments will ultimately benefit both urban biodiversity and the humans who live in cities

Background

Urban areas are expanding in Australia and around the world. Despite being a major cause of biodiversity loss, urban areas also encompass a wide range of ecosystems, include regions of high native biodiversity; and are inhabited by rare and threatened plant and animal species. Urban environments also represent the last chance for many threatened species to be conserved within their natural range.

It should follow that protecting and promoting biodiversity in such areas is critical, yet the value of urban environments for the conservation of native species can be surprisingly contentious, with calls to action still met with surprise, doubt or scepticism. A narrative persists in policy, practice and the public psyche

that urban environments, while useful for engaging people with nature or providing ecosystem services, are of little conservation value. This undervaluing of urban environments stems from misconceptions about the ability of native species to persist in cities and towns.

As a consequence, the potential for conservation gains in unconventional landscapes is often not recognised and rarely prioritised. Unconventional sites may be small, highly modified, or no longer support remnant vegetation and, as such, not always on the conservation radar, even when they are essential to the management and recovery of a threatened species. Planners, land managers and conservation

scientists can be surprised to learn that a threatened species' distribution is entirely urban, or that focusing conservation efforts on unconventional sites might be crucial to its persistence.

Urban environments are arguably among the highest-priority areas for conservation action, because they provide opportunities to conserve species and ecosystems under threat while simultaneously offering people a chance to engage with- and benefit from- nature. Prior research has established that the presence of biodiversity in cities benefits people, improving human health and wellbeing through connection to nature.

Research aim

We aimed to identify and address the key issues and perceptions that are limiting conservation actions and outcomes for urban-restricted threatened species, and generate guiding principles to promote urban biodiversity conservation more broadly.

What we did

To identify threatened plant and animal species whose range is restricted to urban areas in Australia, we cross-checked occurrence records for species listed under the EPBC Act against the areas of 99 Australian towns and cities with populations of over 10,000 people and which are described as predominantly “urban”. This allowed us to shortlist species for which all occurrence records after the year 2000 fell within or close to the boundary of an urban area.

We then reviewed all available recovery documents for each species on our shortlist, to see how policy guidance supports their conservation in urban environments, and to identify key themes around urban conservation.

We also investigated common misconceptions that limit urban conservation action and considered how policy and practice could be updated to make urban conservation actions more effective.

Finally, we developed four key principles to support improved conservation outcomes for urban species (see box below) and recommendations to update conservation policy and practice.

Key findings

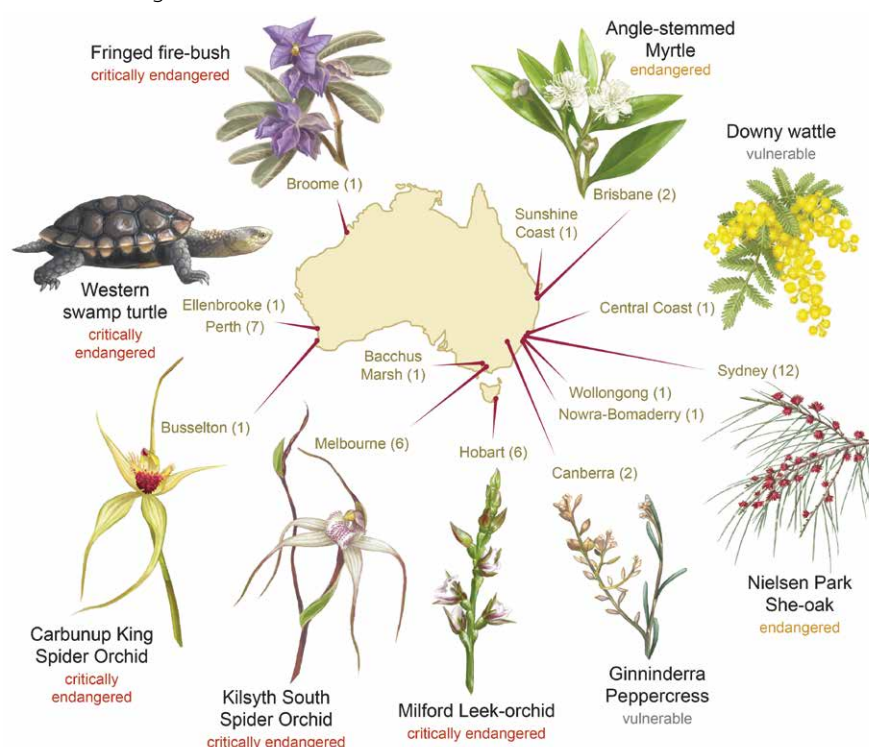
Our shortlisting and validation process led to a list of 39 urban-restricted species (37 plants and two animals) that are found in just one or two Australian cities or towns. These urban-restricted species covered a range of taxonomic groups including orchids, flowering shrubs, large trees, a tortoise and a snail.

The 39 species are not limited to remnants of native vegetation or reserves, but instead occur across diverse land-use types, including roadsides (11 species), private land (10), military lands (5), schools (4), golf courses (4), railway and utility easements (4), airports (3), cemeteries (1) and hospitals (1). One of the largest known populations of the spiked rice flower, for example, is persisting at a golf course, while a species of guinea-flower is known only from the grounds of an airport.

Another important finding was that widespread lack of awareness of urban conservation issues is a key factor limiting the conservation

and recovery of urban-restricted threatened species. It was rarely apparent, for example, in the recovery documents that a species’ natural range was urban-restricted. Furthermore, several species have lost key populations because the relevant authorities or land managers were unaware of either the species’ occurrence at an urban site, or the importance of that site to the species. In such circumstances, the conservation of urban-restricted threatened species is relegated to damage control rather than recovery, as people cannot protect what they are not aware of and will not protect that which seems unimportant.

Cities are an essential piece of the conservation puzzle and recent evidence demonstrates that urban environments are not a “lost cause”, as is sometimes been suggested. If we are to maximise outcomes for threatened species in urban areas this common misconception must be addressed.



The location of urban-restricted threatened species across Australia. The number of species per location is indicated in parentheses. Illustrations by Elia Pirtle.

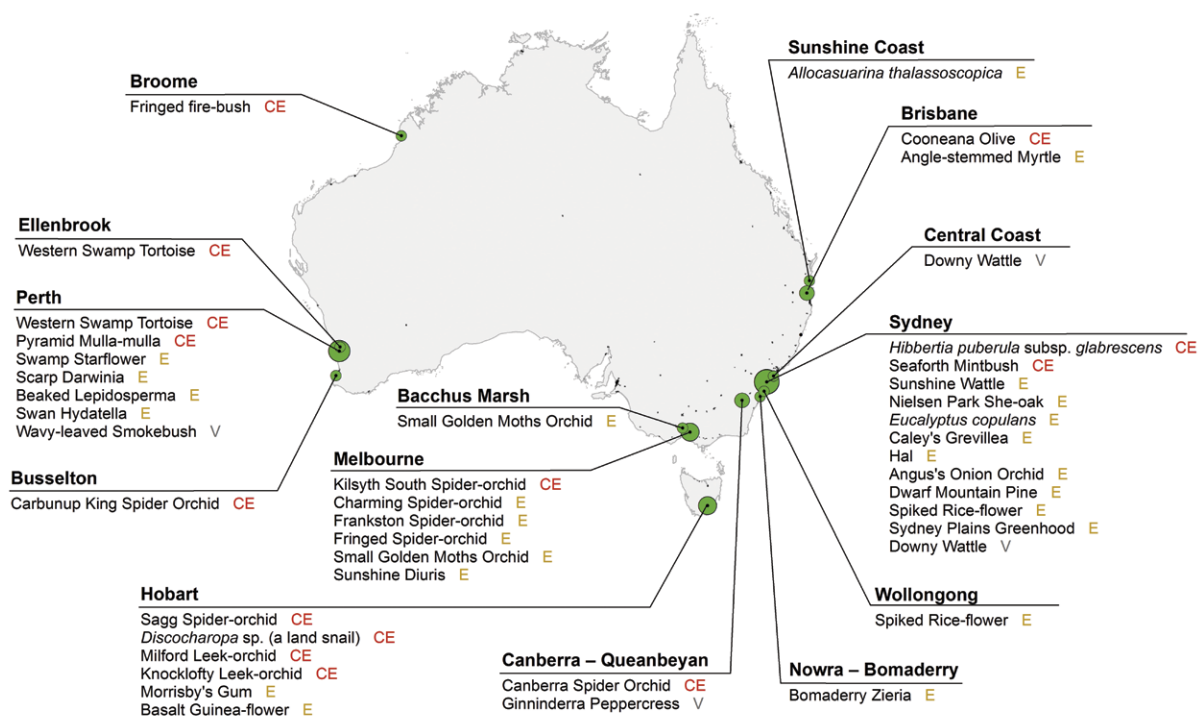
Urban-restricted threatened species rely on a variety of land-use types, such as airports (*Hibbertia puberula glabrescens*; top left), golf courses (spiked rice flower, *Pimelea spicata*; top right), railway verges (sunshine *Diuris*, *Diuris fragrantissima*; bottom left), and roadsides (seaforth mintbush, *Prostanthera marifolia*; bottom right). Illustrations by Elia Pirtle.



Four new principles for urban conservation

1. **Value small urban spaces.** Even a solitary tree or pond can support and sustain populations of native species. Small grasslands in Australia, for example, have been found to contain the only populations of some unique species, and thus contribute to the overall biodiversity of the landscape.
2. **Recognise unconventional habitats.** Potential unconventional habitats are diverse, ranging from large spaces such as former industrial sites (brownfields), golf courses and cemeteries to smaller pockets such as roadsides or cavities within buildings and infrastructure. For example, wetlands constructed to trap sediments and treat stormwater are readily inhabited by a variety of native species. Public and private gardens provide novel resources that might not otherwise exist in the urban landscape. In several Australian cities, urban street trees
3. **Develop creative actions.** Intentionally create conditions for nature to thrive in urban environments, including by minimising human–wildlife conflict, reducing mortality rates or providing resources like feeding or nesting sites that might otherwise be lacking. Artificial structures, such as wildlife bridges or tunnels, can help overcome barriers to movement created by urban infrastructure, such as rope bridges constructed for the western ringtail possum.
4. **Minimise future impacts.** Rapidly expanding urbanisation and higher densities in existing urban areas will have direct impacts such as habitat loss, fragmentation and degradation, as well as indirect impacts that can expand a city's ecological footprint far wider than the immediate area

of development. But we can quantify and map the relative biodiversity value of different parts of the landscape, and systematic planning can help communities and decision-makers choose informed trade-offs, such as designating development zones in areas of lower biodiversity values. Urban ecological research shows that developments can protect and increase habitat, facilitate dispersal and ecological processes, minimise threats and promote human–nature interactions.



Map of urban-restricted species occurring in towns and cities around Australia. Map by Pia Lentini.

Cited material

Soanes, K., & Lentini, P. 2019. When cities are the last chance for saving species. *Frontiers in Ecology and the Environment* 17:4, pp. 225–231. <https://doi.org/10.1002/fee.2032>

Soanes, K., Sievers, M., En Chee, Y., Williams, N. S. G., Bhardwaj, M., Marshall, A. J., & Parris, K. M. 2019. Correcting common misconceptions to inspire conservation action in urban environments. *Conservation Biology* 33:2, pp. 300–306. <https://doi.org/10.1111/cobi.13193>

For perspectives of Traditional Owners, see for example:

<https://nespurban.edu.au/wp-content/uploads/2019/06/Actions-for-Biodiversity-PART-II.pdf>

Additional recommendations

The continuing survival and recovery of the 39 urban-restricted species we identified must incorporate actions on lands not originally intended for conservation, such as golf courses, roadsides or military land. Opportunities range from protection and sympathetic management of existing populations to actively enhancing habitat and establishing new populations. Success in achieving positive conservation outcomes without compromising the urban use of the spaces will depend on strong partnership among a range of stakeholders to balance competing land-use needs and identify “win-win” scenarios.

Conservation actions are not limited to the formal protection of sites, with a suite of approaches available to enhance urban environments, provide resources critical to species and expand the range of suitable habitats through the principles of biodiversity sensitive urban design or conservation development.

Community engagement in local conservation action can be instrumental in managing and recovering threatened urban-restricted species. Proximity to large human populations, while posing risks, also offers advantages. For example, community members in Melbourne invested more than 1300 volunteer-hours in improving the habitat for the last known population of the Frankston spider-orchid.

Such engagement might have been impossible or at least logistically difficult had this population occurred in a more remote location.

We recommend engagement strategies that increase with community ownership, participation and stewardship for local urban-restricted threatened species, and which capitalise on local pride and sense of place through “adoption” by local schools, businesses or community groups. While in some cases the precise location of a threatened species may not be disclosed for its protection, the potential benefits of engaging local communities and inspiring stewardship in species conservation can be substantial. For example, a 2016 crowd-funding campaign to “Save the sexy scented orchids” raised more than \$18,000 from 144 contributors to support the conservation of the urban-restricted Sunshine diuris and small golden moths orchid in Melbourne. We note that fostering community stewardship for urban-restricted threatened species can also increase people’s interest in and experiences with nature, resulting in improved human health and wellbeing.

To remedy the lack of awareness of urban conservation issues, recovery documents and policy guiding a species’ recovery should clearly acknowledge the urban nature of its distribution, where applicable.

Planning or local government teams could also include specialist biodiversity conservation staff to improve consideration of biodiversity conservation in decision-making.

Finally, and importantly, the general absence of perspectives of Traditional Owners in recovery documents should be rectified. Only about half the recovery documents we consulted identified an intention to consult with local Indigenous communities (for 18 of the 39 species), and none described any present Indigenous involvement in conservation activities. Formal recognition of the values, perspectives and knowledge of Indigenous communities would not only enrich conservation outcomes for urban-restricted threatened species but also acknowledge and encourage the inclusion of cultural rights in urban conservation practices.

Ideally, conservation approaches would consider the importance of urban landscapes before cities and towns become a species’ last chance, not simply as an emergency response but as part of a proactive conservation strategy. However, success will depend on adopting novel conservation and urban design strategies, embracing opportunities and partnerships on unconventional lands, and fostering stewardship by communities including Traditional Owners.

Further Information

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