
DiscoverBees



A prospectus for the
discovery and documentation
of Australia's native bees

A Taxonomy Australia and Wheen Bee Foundation campaign.
November 2020



Australia's native bees are critically important but poorly known

Australia accounts for just 5% of the world's land area but has 10% of the global diversity of bees, with an estimated 2,500 species. However, an estimated 1,000 species of Australian native bee species have not yet been discovered, named or documented.

At the current average rate of discovery (average eight new species per year), it will take more than 100 years to fully document Australia's bee fauna. This is too slow – many species are likely to be extinct by the time they are named from specimens in museums and other insect collections.

All species of Australia's native bees, ranging from spectacular, large species up to 25mm long to tiny bees just 2mm long, are important in sustaining our natural environment and for human well-being.

Above: Green carpenter bee, *Xylocopa aerata*.
(Photo: Michael Duncan)

Cover: Roosting blue-banded bees, *Amegilla* species.
(Photo: James Dorey)



Native bees matter for our agriculture

Native bees, together with honey bees, are important for crop pollination. Native bee species such as leafcutter bees, mason bees and alkali bees are used overseas as efficient pollinators of crops such as lucerne and apples. In Australia, blue banded bees show potential as specialist crop pollinators, while stingless bees are being used to pollinate macadamias and berry crops.

Pollinators such as native bees and honey bees support the production of 87 of the leading food crops worldwide (FAO, 2018). Pollinators are responsible for about one third of our food energy intake and three quarters of food diversity, underpinning healthy, balanced diets and therefore our wellbeing. In Australia, the estimated annual economic value of pollination from honey bees alone is \$14.2 billion (Karasinski, 2018) with an additional \$14.2 billion attributed to pollination by non-honey bee insect pollinators, including many native bee species.

Above: Leafcutter bee, *Megachile* species.
(Photo: Michael Duncan)



Native bees matter for our environment

Many native bee species that are not suited to commercial crop pollination still play a vital role in the pollination of native plant species and underpin ecosystem health. These bees have co-evolved with our unique native flora over millions of years. Without a diversity of bee species, our ecosystems are at risk.

Ninety percent of wild flowering plants depend on animal pollination, with a high diversity of wild pollinators being crucial to their pollination even when managed bees are present in high numbers (IPES, 2016). Eucalypt trees and banksias, as well as many wildflowers such as paper daisies and bush-peas, have evolved unique relationships with insect pollinators including native bees, and many are mainly or only pollinated by bees. Without pollinators, many of these plants would not set seeds or reproduce, causing ecosystems to collapse.

Above: Male *Homalictus* bee on Eucalyptus.
(Photo: Jenny Thynne)



Native bees matter for our planet

Rapidly accelerating human impacts are leading us towards an unprecedented global crisis. Climate change, habitat loss, pollution and urban sprawl are all threatening our biodiversity, with some species becoming extinct before they have been discovered and documented. Every extinction is a loss for society, the environment, and our future. Our need for a sound understanding of biodiversity, including native bees, has never been greater.

Above: *Lipotriches* species buzz-pollinating a native flax-lily (Photo: Erica Siegel)



Discovering and documenting native bees

An important branch of science—taxonomy—has the task of discovering, naming and classifying the many species with which we share Australia and the planet. Taxonomists estimate that only 30% of Australian species have been discovered, named and documented so far. Taxonomy is the ‘map’ that others use to understand, appreciate, conserve, manage and utilise our biodiversity, and 70% of the ‘map’ of Australian species is blank. Taxonomists estimate that around 1,000 native bee species—representing 40% of bee species likely to be in Australia—have not yet been discovered or documented.

Taxonomy:

A system for naming and classifying species of plants, animals, and other organisms into groups that are related and share similar qualities.

Taxonomist:

A biologist who specialises in the discovery, naming and classification of organisms.

Taxonomists bring value to multiple sectors of society and the economy, including:

- In food production, trade and biosecurity, by identifying and helping prevent pests and diseases from reaching our shores.
- In medicine and public health, through contributions to drug development and discovery, disease control, and public health risk management.
- In ecology and environmental science, by providing the knowledge that helps environmental managers and governments make balanced decisions, and understand how our environment is changing.
- In industry, through knowledge that inspires new products and services based on millions of years of evolutionary ‘research and development’.
- In science, by providing a key underpinning framework for the whole of biology, and exploring some of the biggest scientific questions, such as how life first arose, how it has evolved over time, and why it is so rich and diverse.
- In society, by stimulating and fostering connections between people and their environment, based on knowledge of the diverse species with which we share our planet.

Taxonomists have a global responsibility to document life on Earth, including Australia’s native bees, before species become extinct and their potential contribution to our economy, well-being and environment is lost.

Above: *Trichocolletes leucogenys* pollinating a native bush-pea.
(Photo: Kerry Stuart)



DiscoverBees: discovering and documenting our native bees

DiscoverBees is an ambitious campaign to fully document Australia's native bee species, including the many species that remain undiscovered and unnamed, in 6 years. This would represent a 16-fold increase on the current rate at which our native bee species are being discovered, documented and named. Without this acceleration, a full documentation of Australia's native bees will take more than a century.

DiscoverBees is part of a mission to discover and document all remaining Australian species—to fill in our 'map' of Australia's biodiversity—in a generation.

DiscoverBees will:

- lead to the discovery and documentation of all Australian native bees, a significant milestone in understanding and documenting Australia's unique biodiversity
- improve our ability to use Australian native bees for pollination services in agriculture and horticulture
- improve the conservation of Australian native bees and reduce the chance that species will become extinct before they are even known, understood and appreciated
- build an open-access identification and knowledge system for Australian bees, including freely available, online illustrated identification tools, information about biology, DNA sequences, and links to relevant literature and other information.

Above: Reed bees, *Exoneura* species, on apple blossom.
(Photo: Bees Business)

Below: Collecting native bees for taxonomic research on Eyre Peninsula, South Australia. (Photo: Remko Leijds)





How you can help

DiscoverBees is the most important and ambitious campaign ever attempted to discover and document Australia's bees. The budget needed to achieve this is modest relative to the magnitude of its impact, for agriculture, horticulture, conservation and the environment.

The cost of the DiscoverBees campaign is \$600,000 per year (\$3.6million over 6 years).

Above: Neon cuckoo bee, *Thyreus nitidulus*.
(Photo: Louise Docker)

Your donation counts

A donation to When Bee Foundation's **Rita Fund** will help us with our campaign to discover and document Australia's bees.



Visit our website at WhenBeeFoundation.org.au for one-off or monthly donations.



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Contact us or visit the websites for more information on the DiscoverBees campaign.

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