Turns out that in Australia, you are probably closer than you think to hundreds or thousands of species that don't have names. They are scientifically and culturally anonymous Australians.

If you live in a capital city, these unnamed Aussies are in your state or territory museum, and if you live in a regional area, they are living in your local nature reserve.

Why is this the case? Australia is acknowledged as a "megadiverse" nation, with a particularly large slice of the world's biodiversity. Our natural environments span from tropical forest to alpine meadow, and from some of the driest deserts to mangrove swamps.

Because almost all of our species only live on this continent, it is up to us to study them. Here is the catch – because this is a large continent with relatively few people, there are also few dollars to fund such discovery research.

Of the estimated 500,000 Australian species, half are insects and only perhaps 20% to 30% of these have been named, so there are at least 100,000 unnamed Australian insect species. These unknown elements of biodiversity represent an almost completely untapped opportunity and resource.

What's in a name?

So what's in a name and why does it matter, all this naming in the name of science? Is it just a pointless, egotistical quest for scientific immortality?

No, turns out that it's important, and often quite challenging. When they are minted, species names are carefully crafted so that they do not duplicate other species' names.

For example, one of the first Australian insects to be given a scientific name was the metallic green weevil discovered during James Cook's first voyage, *Chrysolopus spectabilis* , also known as the Botany Bay Weevil.

The Danish zoologist Johan Christian Fabricius gave it that name in 1775, and no other animal can now have the name. Type that name into Google, and you will retrieve all sorts of information on it, including beautiful pictures, maps of its distribution, plants that it feeds on.

Worldwide, we have named more that 1.5 million species over the past 250 years, so finding a unique name also can take some careful sleuthing in online databases, such as the Australian Faunal Directory
.

This is because species names are used as globally unique passwords to information. You can use the species name to search for information on the species in books, and online resources such as the Atlas of Living Australia .

If a species doesn't have a name, any information on it is impossible to find. Conversely, if we gave every species the name Bob, information on any particular Bob would be impossible to separate out.

The research to figure out if a species is new can be very challenging. Some species physically look almost exactly the same as other species (they are called sibling species). And this can have real-world consequences.

I estimate that distinguishing a Queensland fruit fly (scientific name *Bactrocera tryoni*), a major fruit pest, from one of its many closely related but harmless sibling fruit fly species, would be impossible for all but a few well-trained entomologists.

The biosecurity factor

But being able to accurately distinguish these species matters a lot in the real world when it comes to biosecurity and developing international trade.

It is almost always the case that species that are siblings in an anatomical sense are also very difficult to distinguish genetically; they very often have the same DNA barcode sequences, or

overlapping sets of DNA sequences.

Government quarantine services often contract our scientists to develop protocols for distinguishing quarantine threats from harmless local species.

If you live in Canberra, you are very close to swarms of unnamed species in CSIRO's Australian National Insect Collection. We manage a collection of more than 12 million specimens, almost all of them from Australia.

Not surprisingly, it is the largest collection of Australian insects in the world.

We have the vast majority of named Australian insect species in the collection, plus tens of thousands of unnamed species. The collection is like a vast hard drive of Australia's biodiversity.

Our researchers continue the task of describing and understanding Australia's insect species using more and more sophisticated techniques.

Unnamed species belong to a wide range of groups such as mosquitoes that bite humans, and innocent native beetles that look just like major timber and grain pests native to our overseas trading partners.

Often species wait in the collection for decades before study. A PhD student and I are in the process of naming an entire new lineage of flower pollinating insects in the collection, from specimens found in a remote corner of Western Australia 35 years ago.

We decide if a species is new by comparing it closely with all its named relatives, siblings and others. Hence the need to have a comprehensive set (a collection) in one physical or virtual place.

Because there are so many insect species, there are too many to compile a book or website with every species photographed and listed. Even if we did, it would have too many pages of very similar-looking species to flick through to make the comparisons.

So we use various identification tools to help us work out if a newly collected species already has a name, or needs one.

I name that critter…

Traditionally, we have used anatomical keys (What bug is that?), that guide the user to an identification by making a series of carefully selected physical observations and comparisons.

But more recently, we've been using vast databases of molecular sequence barcodes , analogous to the white pages for biodiversity, to help us decide whether the species is new or not.

The number of genetic mutations shared among populations are increasingly used as evidence of species status.

We are also experimenting with image recognition software to help us. A little bit like a criminal investigation, the best result is when all lines of evidence point in the same direction, telling us that the species is new.

Federal government and private industry joint initiatives, such as Bush Blitz , are providing valuable information on the species in our national parks and other reserves, but we have a long way to go.

While we continue to grapple with the task of keeping trade routes open and managing and conserving our biodiversity for future generations and opportunities, remember the salient point here: most of Australia's species are unnamed, and we know next to nothing about them.

If we have information on where these unnamed species occur, what features they have, or what they do in the environment, we cannot easily retrieve and analyse it. Hence we cannot readily distinguish native species from important overseas pests.

We also don't have the information needed to make a choice about where to invest our conservation resources optimally. Efforts to build trade and conserve our biodiversity are compromised until we know more about Australian species. This compromise is a risk we don't need to take.

The census is coming

We are on the eve of the 2016 Australian census . What a great nation-building goal it would be to initiate a species census.

It would give us the confidence that we had a good handle on our biodiversity – what it is, where it occurs, how well we are conserving it and what properties make it beneficial or harmful to us.

In terms of Australia's federal budget (somewhere around A$450-billion dollars), the annual resources required for such a species census would be a drop in the ocean.

Are we responsible stewards of this ancient and fascinating land, or are we renting a share house? And can we really say that we know what it is to be Australian when we don't know the names and addresses of most Australians?

David Yeates receives funding from CSIRO, The Australian Biological Resources Study, the US National Science Foundation, and holds the Schlinger endowed research position at the Australian National Insect Collection.

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Read more http://theconversation.com/why-so-many-australian-species-are-yet-to-be-named-59237