CALEYI

Australian Plants SOCIETY NSW

NORTHERN BEACHES GROUP

austplants.com.au/northern-beaches

January/February 2022

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APS Northern Beaches Group acknowledges the Traditional Owners of the land on which our activities take place.
We pay our respects to Elders past, present and emerging, and recognise the continuing connection to lands, waters and communities.

CALENDAR

UNFORTUNATELY FEBRUARY MEETING CANCELLED DUE TO A NUMBER OF REASONS

Wednesday February 16, 2022 APS Northern Beaches Group visit the **Australian Museum**.
"The evolution of plants in Australia" talk given by **Graham McLean.**
The talk will be illustrated by actual plant fossils held in the Palaeontology Collection at the Museum.

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If you have any photographs, articles, links or suggestions for Caleyi please feel free to send to me Jane March march@ozemail.com.au 0407 220 380.

MEMBERS JOTTINGS

Harry Loots writes: 'At first I thought that there were Christmas decorations on the Wollemi Pines (Wollemia nobilis), but these are small nets to catch seed to propagate the pines. Apparently this has been quite successful, especially in cool conditions.' Lindy Monson

Conny Harris found this amazing dragonfly in her patch.

Austrophlebia costalis - giant dragonfly Conny

You may care to watch this lovely ABC video of Wildflowers of the Mid-West of Western Australian https://iview.abc.net.au/video/RF2109W001S00

John Tann/Wikimedia Commons, CC BY-SA

HIBBERT'S FLOWERS AND HITLER'S BEETLE – WHAT DO WE DO WHEN SPECIES ARE NAMED AFTER HISTORY'S MONSTERS?

The Conversation December 16, 2021 Kevin Thiele, Adjunct Assoc. Professor, The University of Western Australia

"What's in a name?", asked Juliet of Romeo. "That which we call a rose by any other name would smell as sweet."

But, as with the Montagues and Capulets, names mean a lot, and can cause a great deal of heartache.

My colleagues and I are taxonomists, which means we name living things. While we've never named a rose, we do discover and name new Australian species of plants and animals – and there are a lot of them!

For each new species we discover, we create and publish a Latin scientific name, following a set of international rules and conventions. The name has two parts: the first part is the genus name (such as Eucalyptus), which describes the group of species to which the new species belongs, and the second part is a species name (such as globulus, thereby making the name Eucalyptus globulus) particular to the new species itself. New species are either added to an existing genus, or occasionally, if they're sufficiently novel, are given their own new genus.

Some scientific names are widely known – arguably none more so than our own, Homo sapiens. And gardeners or nature enthusiasts will be familiar with genus names such as Acacia, Callistemon or Banksia. This all sounds pretty uncontroversial. But as with Shakespeare's star-crossed lovers, history and tradition sometimes present problems.

What's in a name?

Take the genus Hibbertia, the Australian guineaflowers. This is one of the largest genera of plants in Australia, and the one we study. There are many new and yet-unnamed species of Hibbertia, which means new species names are regularly added to this genus.

Many scientific names are derived from a feature of the species or genus being named, such as Eucalyptus, from the Greek for "well-covered" (a reference to the operculum or bud-cap that covers unopened eucalypt flowers).

Others honour significant people, either living or dead. Hibbertia is named after a wealthy 19th-century English patron of botany, George Hibbert.

And here's where things stop being straightforward, because Hibbert's wealth came almost entirely from the transatlantic slave trade. He profited from taking slaves from Africa to the New World, selling some and using others on his family's extensive plantations, then transporting slave-produced sugar and cotton back to England.

Hibbert was also a prominent member of the British parliament and a staunch opponent of abolition. He and his ilk argued that slavery was economically necessary for England, and even that slaves were better off on the plantations than in their homelands.

George Hibbert: big fan of flowers and slavery. Thomas Lawrence/Stephen C. Dickson/Wikimedia Commons, CC BY-SA

Even at the time, his views were considered abhorrent by many critics. But despite this, he was handsomely recompensed for his "losses" when Britain finally abolished slavery in 1807.

So, should Hibbert be honoured with the name of a genus of plants, to which new species are still being added today – effectively meaning he is honoured afresh with each new publication?

We don't believe so. Just like statues, buildings, and street or suburb names, we think a reckoning is due for scientific species names that honour people who held views or acted in ways that are deeply dishonourable, highly problematic or truly egregious by modern standards.

Just as Western Australia's King Leopold Range was recently renamed to remove the link to the atrocious Leopold II of Belgium, we would like Hibbertia to bear a more appropriate and less troubling name.

The same goes for the Great Barrier Reef coral Catalaphyllia jardinei, named after Frank Jardine, a brutal dispossessor of Aboriginal people in North Queensland. And, perhaps most astoundingly, the rare Slovenian cave beetle Anophthalmus hitleri, which was named in 1933 in honour of Adolf Hitler.

This name is unfortunate for several reasons: despite being a small, somewhat nondescript, blind beetle, in recent years it has been reportedly pushed to the brink of extinction by Nazi memorabilia enthusiasts. Specimens are even being stolen from museum collections for sale into this lucrative market.

Aye, there's the rub

Unfortunately, the official rules don't allow us to rename Hibbertia or any other species that has a troubling or inappropriate name.

To solve this, we propose a change to the international rules for naming species. Our proposal, if adopted, would establish an international expert committee to decide what do about scientific names that honour inappropriate people or are based on culturally offensive words.

An example of the latter is the many names of plants based on the Latin caffra, the origin of which is a word so offensive to Black Africans that its use is banned in South Africa.

Some may argue the scholarly naming of species should remain aloof from social change, and that Hibbert's views on slavery are irrelevant to the classification of Australian flowers. We counter that, just like toppling statues in Bristol Harbour or removing Cecil Rhodes' name from public buildings, renaming things is important and necessary if we are to right history's wrongs.

We believe that science, including taxonomy, must be socially responsible and responsive. Science is embedded in culture rather than housed in ivory towers, and scientists should work for the common good rather than blindly follow tradition. Deeply problematic names pervade science just as they pervade our streets, cities and landscapes.

Hibbertia may be just a name, but we believe a different name for this lovely genus of Australian flowers would smell much sweeter.

This article was co-authored by Tim Hammer, a postdoctoral research fellow at the State Herbarium of South Australia.

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WITHOUT URGENT ACTION, THESE ARE THE STREET TREES UNLIKELY TO SURVIVE CLIMATE CHANGE

theconversation.com January 11, 2022 Renée M. Prokopavicius, David S. Ellsworth, Sebastian Pfautsch, Western Sydney University

Cities across the world are on the front line of climate change, and calls are growing for more urban cooling. Many governments are spending big on new trees in public places – but which species are most likely to thrive in a warmer world?

Numerical targets such as "one million trees" dominate tree-planting programs in cities such as Los Angeles, New York, Shanghai, Melbourne and Sydney. But whacking a million trees into the ground won't necessarily mean greener suburbs in decades to come.

Often, not enough attention is paid to selecting the right trees or providing enough water so they survive a hotter, drier climate in future.

In our recent research, we assessed the effects of extreme heat and drought on urban tree species. Some much-loved tree species, widely planted across our cities, did not handle the conditions well. It shows how important decisions must be made today for urban greening programs to succeed in a warmer world.

We must pay more attention to ensuring urban trees survive climate change. Shutterstock

In January 2020, following several years of drought, Penrith in Western Sydney hit 48.9°C – the hottest temperature ever recorded in Greater Sydney. Researchers later assessed about 5,500 street trees and found more than 10% displayed canopy damage. Exotic deciduous species fared the worst.

The event showed how simultaneous intense heat and drought can damage urban trees. Trees cool down in hot temperatures by losing water through microscopic openings in their leaves called stomata. Sufficiently watered trees can often tolerate extreme hot temperatures, while drought-stressed trees may struggle to survive.

Our research involved stress-testing 20 broadleaf evergreen tree species from habitats ranging from tropical rainforests to semi-arid woodlands.

ool our cities and those that will survive increasingly harsh conditions.Seedlings were grown in a coordinated glasshouse experiment. After the plants were established and acclimatised, half of them – five plants per species – were exposed to a gradual, five-week drought.In the final week of water deficit, all plants were exposed to conditions simulating a six-day heatwave.

What we found

The 20 plant species varied widely in their ability to handle these conditions.

Of the plants exposed to both heat and drought, two species suffered modest crown dieback (a decline in health of the canopy) and another four species suffered extensive crown dieback.

Most plants resumed growth after the heatwave but several individual plants died: two swamp banksia (Banksia robur) and one crimson bottlebrush (Callistemon citrinus).

Species with dense wood and small, thick, dense leaves use water efficiently and are drought-tolerant. The species which fared best in our study included orange jasmine (Murraya paniculata), inland rosewood (Alectryon oleifolius) and Australian teak (Flindersia australis).

Even when plant species had access to water, their tolerance of heat stress varied widely. Swamp banksia (Banksia robur) and powderpuff lilly pilly (Syzygium wilsonii) suffered extensive crown dieback even with access to water. This shows warmer heatwaves may threaten urban trees in both wet and dry years.

While some species may fare well in heat and drought, they may not necessarily be the best choice for cooling our cities. Many drought-tolerant species such as leopardwood (Flindersia maculosa) grow slowly and have sparse foliage that provides little shade or cooling. But these species could be planted in sunny, dry areas to create habitat and improve biodiversity.

So what about trees like the weeping fig (Ficus microcarpa) and London plane tree (Platanus x acerifolia), which are widely planted in Sydney, Melbourne and other Australian cities?

These trees are at greater risk during heat and drought, because they have soft, low-density wood and thin, large leaves that are vulnerable to heat. But they grow quickly and form extensive canopies that help cool urban areas. So these trees should be planted where water is available, either from rain or through active management such as irrigation.

Looking ahead to a hot future

Our research highlights how access to water is crucial for the survival of urban trees during hotter and drier summers. That means urban greening programs must also incorporate elements of so-called "blue" infrastructure – retaining water in urban landscapes via engineered solutions and making it available for plant uptake. Such infrastructure comes together under the umbrella of "water sensitive urban design".

Examples include passive irrigation (where trees draw water from storage pits containing stormwater) or raingardens – garden beds that filter stormwater runoff. Planting young trees in locations where such design is applied will improve their odds of survival.

Such methods offer multiple benefits: increasing the health of trees, helping prevent flooding during storms and reducing the need for additional irrigation from local water supplies.

Across the world, extreme heat in cities will affect citizens, infrastructure and natural environments. Effective planning for urban trees is needed now to strike the right balance between trees that cool our cities and those that will survive increasingly harsh conditions.

A spider fossil from McGraths Flat. (Michael Frese)

MIND-BLOWING NEW FOSSIL SITE FOUND IN THE 'DEAD' HEART OF AUSTRALIA

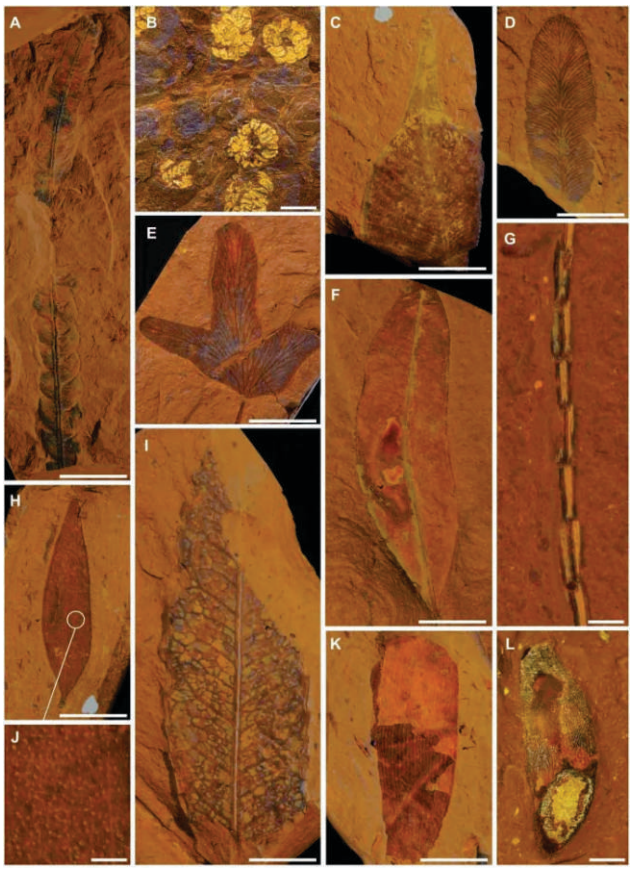
sciencealert. com January 7, 2022 Michelle Starr

The arid heart of Australia may not easily support life now, but once, many aeons ago, it was lush and teeming. What is now arid desert and dry shrub- and grasslands was once thick with dense forests, alive with life.

In one of these grasslands, in the Central Tablelands of NSW, paleontologists have found new evidence of this abundance of life. A new fossil site that can most aptly be described as "exceptional" has turned up fossils of spiders, insects, fish, plants and even a bird feather, dating to the Miocene 11 to 16 million years ago.

"The fossils we have found prove that the area was once a temperate, mesic rainforest and that life was rich and abundant here in the Central Tablelands, NSW," said paleontologist Matthew McCurry from the Australian Museum Research Institute.

"Many of the fossils that we are finding are new to science and include trapdoor spiders, giant cicadas, wasps and a variety of fish. Until now it has been difficult to tell what these ancient ecosystems were like, but the level of preservation at this new fossil site means that even small fragile organisms like insects turned into well-preserved fossils."



Plant fossils from McGraths Flat. (McCurry et al., Sci. Adv., 2022)

The assemblage, named McGraths Flat, is so exceptional that it has been classified as a Lagerstätte – a sedimentary fossil bed that's so extraordinary that sometimes even soft tissues have been preserved. In McGraths Flat, organisms have been so well preserved that even subcellular structures can be made out in some fossils.

Even more amazingly, it's a type of rock in which exceptional fossils are not usually seen, an iron-rich rock called goethite.

"We think that the process that turned these organisms into fossils is key to why they are so well preserved," McCurry said. "Our analyses suggest that the fossils formed when iron-rich groundwaters drained into a billabong, and that a precipitation of iron minerals encased organisms that were living in or fell into the water."

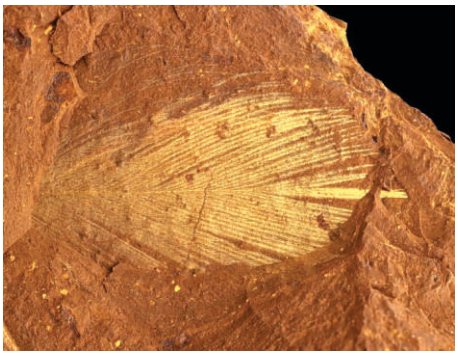
The fossils in the assemblage bear a resemblance to the ecosystems in modern Australian rainforests, the researchers said, but it's the fine details that really make a difference.

For instance, subcellular structures called melanosomes that give tissues their pigment have been preserved in the site's fossilized feather and also in the eyes of a fish and a fly.

Although the melanosomes themselves are unpigmented, their structure can be compared to the structure of modern melanosomes to help figure out how the tissues might have been hued. This allows the researchers to figure out what colors the various McGraths flat animals were, including the feather.

"The fossils also preserve evidence of interactions between species," said microbiologist Michael Frese of the University of Canberra.

"For instance, we have fish stomach contents preserved in the fish, meaning that we can figure out what they were eating. We have also found examples of pollen preserved on the bodies of insects so we can tell which species were pollinating which plants."



The feather fossil. (Michael Frese)

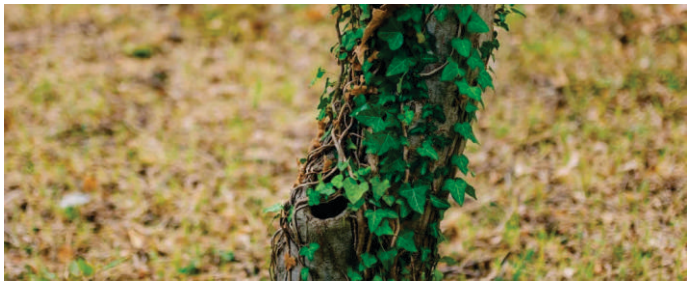
Soberingly, the fossils also might contain a hint of what's in store for our future. According to an analysis of the pollen grains in the assemblage, the McGraths Flat rainforest was being encroached upon by arid climate areas. This is not unexpected; during the Miocene, global temperatures had started to rise; it was during this period that the Australian continent started to transform from lush to arid.

Since global mean temperatures are rising, the ecosystem found in McGraths Flat could show us how life might change in Australia's current rainforests in the years to come.

"The McGraths Flat plant fossils give us a window into the vegetation and ecosystems of a warmer world, one that we are likely to experience in the future," said botanist David Cantrill of the Royal Botanic Gardens Victoria in Australia.

"The preservation of the plant fossils is unique and provides important insights into a time period for which the fossil record in Australia is rather poor."

The research has been published in Science Advances.



(Nadtochiy/iStock/Getty Images)

WHY INVASIVE PLANTS PUSHING OUT NATIVE FLORA IS PUSHING US CLOSER TO A 'NEW PANGAEA'

Science Alert.com December 18, 2021. Carly Cassella

According to the first global analysis of plant diversity, the world's flora is growing increasingly uniform, even on isolated islands like Australia.

For decades now, scientists have been warning the world we are headed for a new geological epoch, called the 'Homogecene', when unique life forms become overshadowed by more adaptable species that can live alongside humans.

The new research on flowering plants reveals the extent to which that may already be happening to some flora.

"These effects are now evident even in the most remote corners of the world," says ecologist Mark van Kleunen from the University of Konstanz in Germany.

"Unless more effective protective measures are taken to counter the ongoing spread and naturalization of alien plants in the future, they will continue to destroy the uniqueness of our ecosystems—making the world a less diverse place."

This destruction of ecosystems is largely thanks to us. Humans have collapsed the distance between ecoregions worldwide, and some scientists are concerned that the loss of natural barriers could one day create a 'New Pangaea'.

Instead of solid land connecting all the major continents and their flora and fauna, the bridge this time will be us. On our backs already flow numerous super-invaders, ready to take over new territory and displace native species.

Their domination has begun.

Blackberries, for example, growing feral in Australia, impact at least 47 threatened species through reduction of habitat and by providing shelter to other introduced predators and competing species. They cost hundreds of millions of dollars in damage and containment attempts.

Stronger biosecurity measures for human trade and transport could help protect the native vegetation that's left on our planet for hotspots like Australia and other Pacific islands.

Isolated nations like these are home to many unique endemic species, and yet because these life forms have evolved to suit a very specific ecological niche, they are least likely to adapt to a rapidly changing world.

Drawing on floral data from 658 regions around the world, including 189,762 flowering-plant species, researchers have now broadly compared how native flowers are coping compared to invasive flowers.

Over time, their findings suggest geographically distant plants havebecome less distinct from one another due to the introduction of invasive species.

Ultimately, the authors found alien plants are more likely to become naturalized in a distant environment when the climate, and especially the temperature, is similar to their last home.

Rainfall, on the other hand, didn't seem to influence plant uniformity nearly as much. This suggests many invasive plants are weeds, thriving on agricultural lands and along rivers.

"The more similar two regions are in terms of climate, the more likely it is that a plant from one region will succeed in establishing itself as a naturalized species in the other region, once geographic barriers have been crossed," explains ecologist Qiang Yang, also from the University of Konstanz.

"In a sense, plants from a region with short climatic distance to their new habitat are climatically pre-adapted."

Those regions of the world that share the same current or past political administrations also have relatively uniform flora.

This is likely because human trade and transport are much more common between states in a nation, nations in a union, or historic colonial networks.

At one point, for instance, the British global empire had set up 126 botanical gardens around the world, all of which exchanged plant species.

Similarly, European colonizers brought many alien species to Australia, which is probably why this region of the world is such a hotspot for homogenization.

agric.wa.gov.au

Today, invasive alien plants in Australia number in the thousands, and each year about 20 new species are added to the list, displacing even more native plants and altering natural habitats.

The ecological, evolutionary, and socioeconomic consequences of all this change remain unclear. Still, given how important biodiversity appears for local ecosystems, the arrival of a 'New Pangaea' could be very destructive.

Previous studies suggest the last time a supercontinent existed on Earth, it increased the cosmopolitanism of global fauna and led to mass extinctions, causing homogenous 'disaster faunas' to take over.

There's no reason why it couldn't happen again.

The current analysis is a rough estimate of how much homogeneity has already occurred among flowering plants, but far more research is needed to determine how uniform the entire biosphere has become and why.

Only then will we know what needs to be done to save it.

The study was published in Nature Communications.

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MORE THAN 200 AUSTRALIAN BIRDS ARE NOW THREATENED WITH EXTINCTION – AND CLIMATE CHANGE IS THE BIGGEST DANGER

theconversation.com December 1, 2021 Stephen Garnett, Professor of Conservation and Sustainable Livelihoods, Charles Darwin University, Barry Baker, University of Tasmania

Up to 216 Australian birds are now threatened – compared with 195 a decade ago – and climate change is now the main driver pushing threatened birds closer to extinction, landmark new research has found.

The Mukarrthippi grasswren is now Australia's most threatened bird, down to as few as two or three pairs. But 23 Australian birds became less threatened over the past decade, showing conservation actions can work.

The findings are contained in a new action plan released today. Last released in 2011, the action plan examines the extinction risk facing the almost 1,300 birds in Australia and its territories. We edited the book, written by more than 300 ornithologists.

Without changes, many birds will continue to decline or be lost altogether. But when conservation action is well resourced and implemented, we can avoid these outcomes.

Without change, threatened birds such as the southern emu wren will be lost. Barry Baker

The numbers tell the story

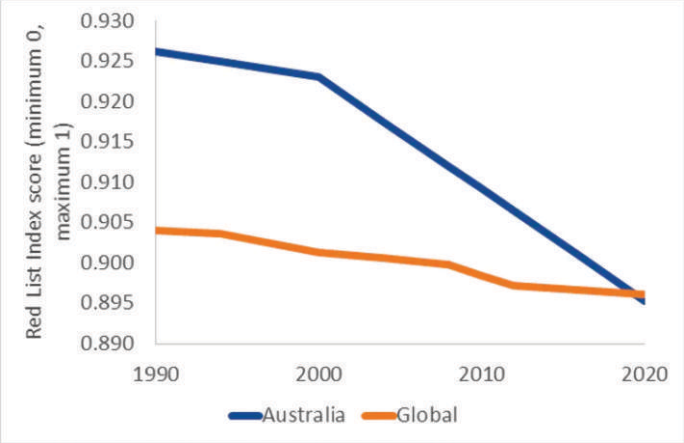
The 216 Australian birds now at risk of extinction comprise:

- 23 critically endangered
- 74 endangered
- 87 vulnerable
- 32 near-threatened.

This is up from 134 birds in 1990 and 195 a decade ago.

We assessed the risk of extinction according to the categories and criteria set by the International Union for Conservation of Nature in its Red List of threatened species.for Australian birds.

As the below graph shows, the picture of bird decline in Australia is not pretty – especially when compared to the global trend.



Authors supplied

What went wrong?

Birds are easily harmed by changes in their ecosystems. Dean Ingwersen/BIRDLIFE AUSTRALIA

Birds are easily harmed by changes in their ecosystems, including introduced species, habitat loss, disturbance to breeding sites and bushfires. Often, birds face danger on many fronts. The southeastern glossy black cockatoo, for example, faces no less than 20 threats.

Introduced cats and foxes kill millions of birds each year and are considered a substantial extinction threat to 37 birds.

Land clearing and overgrazing are a serious cause of declines for 55 birds, including the swift parrot and diamond firetail. And there is now strong evidence climate change is driving declines in many bird species.

A good example is the Wet Tropics of far north Queensland. Monitoring at 1,970 sites over 17 years has shown the local populations of most mid- and high-elevation species has declined exactly as climate models predicted. Birds such as the fernwren and golden bowerbird are being eliminated from lower, cooler elevations as temperatures rise.

As a result, 17 upland rainforest birds are now listed as threatened – all due to climate change.

The Black Summer bushfires of 2019-20 – which were exacerbated by climate change – contributed to the listing of 27 birds as threatened.

We estimate that in just one day alone – January 6, 2020 – about half the population of all 16 bird species endemic or largely confined to Kangaroo Island were incinerated, including the tiny Kangaroo Island southern emu-wren.

Some 91 birds are threatened by droughts and heatwaves. They include what's thought to be Australia's rarest bird, the Mukarrthippi grasswren of central west New South Wales, where just two or three pairs survive.

Climate change is also pushing migratory shorebirds towards extinction. Of the 43 shorebirds that come to Australia after breeding in the Northern Hemisphere, 25 are now threatened. Coastal development in East Asia is contributing to the decline, destroying and degrading mudflat habitat where the birds stop to rest and eat.

But rising seas as a result of climate change are also consuming mudflats on the birds' migration route, and the climate in the birds' Arctic breeding grounds is changing faster than anywhere in the world.

The Black Summer bushfires devastated some bird populations. James Ross/AAP

The good news

The research shows declines in extinction risk for 23 Australian bird species. The southern cassowary, for example, no longer meets the criteria for being threatened. Land clearing ceased after its rainforest habitat was placed on the World Heritage list in 1988 and the population is now stable.

Other birds represent conservation success stories. For example, the prospects for the Norfolk Island green parrot, Albert's lyrebird and bulloo grey grasswren improved after efforts to reduce threats and protect crucial habitat in conservation reserves.

Intensive conservation efforts have also meant once-declining populations of several key species are now stabilising or increasing. They include the eastern hooded plover, Kangaroo Island glossy black-cockatoo and eastern bristlebird.

And on Macquarie Island, efforts to eradicate rabbits and rodents has led to a spectacular recovery in seabird numbers. The extinction risk of nine seabirds is now lower as a result.

There's also been progress in reducing the bycatch of seabirds from fishing boats, although there is much work still to do.

The Albert's lyrebird has been a conservation success. Barry Baker

Managing threats

The research also examined the impact of each threat to birds – from which we can measure progress in conservation action. For 136 species, we are alarmingly ignorant about how to reduce the threats – especially climate change.

Some 63% of important threats are being managed to a very limited extent or not at all. And management is high quality for just 10% of "high impact" threats. For most threats, the major impediments to progress is technical – we don't yet know what to do. But a lack of money also constrains progress on about half the threats.

What's more, there's no effective monitoring of 30% of the threatened birds, and high-quality monitoring for only 27%.

Nevertheless, much has been achieved since the last action plan in 2010. We hope the new plan, and the actions it recommends, will mean the next report in 2030 paints a more positive picture

APS NSW - Central West Trip: being rescheduled - dates tbc

When: 1 Apr 2022 ,
Where: Burrendong, Wellington, Dubbo, Narromine, Parkes

APS NSW is establishing an interest group in which we share and acquire greater knowledge and skills in how to support regeneration, revegetation, restoration of NSW natural landscapes, leading to greater resilience.

One objective of the Society is to support the protection and conservation of native flora and fauna, which can be achieved by the conservation of natural environments, habitat management and the restoration of environments that have been degraded through human activity.

This trip will provide those attending the opportunity to acquire a greater understanding of native plants and habitat resilience and what individuals and collective groups can do to assist.

We have arranged to visit seven properties in the Central West; at Forest Reef near Milthorpe, Dubbo, Narromine and Toongi. Six of the owners are actively involved in restoring the natural revegetation, partially or completely on their properties. The property owners are enthusiastic to show and discuss with us what they have achieved in restoring their properties.

There is no charge for this trip. However, the cost of food, travel and accommodation will be at your own expense. You are required to register if you plan to join us. This is so we can let the property owners know how many people they can expect.

The ANPSA 2022 Biennial Conference dates are Saturday 10 September to Friday 16 September 2022 at the Kiama Pavilion.

The theme is Australian flora, past present and future.

We will explore the flora of thousands of years ago to the present day and the world of the future!

We are hosting tours pre- and/or post-conference to beautiful places in NSW, like the South Coast, Blue Mountains, Lord Howe Island, Warrumbungles/Pilliga and Sydney.

We kick off the conference on the Saturday 10 September, with a complimentary tour of the Kiama region, followed by a Market fair - a combined farmers market and native plant sale - on the Sunday and then conference sessions and excursions from the Monday to the Friday.