

Nature's big questions



How biodiversity science
helps us make more
informed decisions
for the future.

An accessible guide
to understanding
evidence, science
and decision-making.



Nature's big questions:



Discover how biodiversity science helps us understand nature, solve complex challenges and turns knowledge into action for the benefit of nature and communities.

What is biodiversity and biodiversity science?

Biodiversity is short for biological diversity. It refers to the variety of lifeforms and their interactions. There is diversity within species, between species and of ecosystems, which refer to the different habitats, communities, and ecological processes across the planet.

Biodiversity science investigates questions such as: What species live in a place? How do they survive and interact? What threats do they face? How can we manage landscapes to support healthy ecosystems?

Why is Western Australia's biodiversity globally significant?

Western Australia is recognised globally for its biodiversity. Our State is home to many species that are endemic, meaning they are found nowhere else in the world.

This incredible diversity has developed over millions of years. WA's vast size, changing climates, ancient landscapes, unique soils and large areas of relatively untouched habitat have created the perfect conditions for species to evolve in isolation.

Eight of Australia's 15 biodiversity hotspots are found in WA, including the South West Australian biodiversity hotspot, which is one of only 36 internationally recognised biodiversity hotspots on Earth.

Why is biodiversity important to First Nations peoples?

For Aboriginal and Torres Strait Islander peoples, everything on Country is connected. Plants, animals, landscapes, waterways and weather are part of a deep system of knowledge, culture and relationships that has sustained communities for thousands of years.

Caring for Country means maintaining balance between people and nature.

Bringing together Traditional Knowledge and contemporary science helps us better understand and care for the environment.



Nature's big questions:



Q1.

Why does biodiversity science matter?

A.

Biodiversity science helps us understand animals, plants, fungi and microorganisms, how they interact, and how they're changing over time. The natural world is complex and we need scientific evidence to understand it.

Western Australia is home to some of the most unique biodiversity on Earth. As nature loss and climate change accelerate, science tells us what is changing, what is at risk and what actions can protect our environment for future generations.



Without evidence from biodiversity science, decisions about the environment are made with uncertainty.

Q2.

What big questions can it answer?

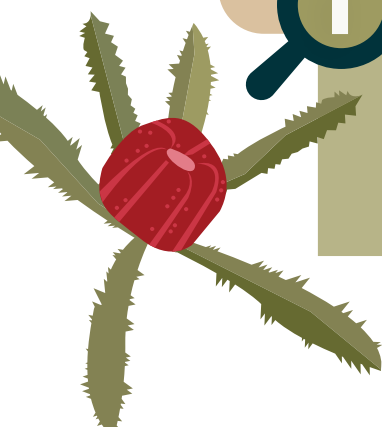
A.

Biodiversity science tackles some of our most pressing environmental challenges, including:

- Which species and ecosystems are most important to protect?
- How are landscapes changing and what is driving nature loss?
- What threats, including climate change, are affecting biodiversity?
- How can damaged environments be restored?
- What actions deliver the greatest benefit for nature and people?



Environmental challenges are complex because many different factors have an impact on landscapes over time. Long-term environmental data, from historical records to satellite monitoring can help reveal information about cumulative impacts, to better understand how to manage them.



Nature's big questions:



Q3.

Why does biodiversity science need to be independent?

A.

Independent science allows research to be conducted without being steered toward a particular outcome. This means that experts can use rigorous methods to investigate the big questions, then share independent, quality knowledge.

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This trusted evidence helps governments, industry, communities and conservation organisations understand challenges, assess options and make decisions with greater confidence.

Q4.

Why is collaboration key to addressing nature's big questions?

A.

Nature loss and climate change are too big and too complex for any one scientific discipline or sector to solve alone. Real progress happens when ecologists, geneticists, data scientists and other researchers combine expertise with Traditional Owners, communities, government and industry.

Bringing different disciplines and sectors allows challenges to be shared and sparks innovative thinking to develop practical, workable solutions.

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Collaboration helps ensure science is relevant, practical and able to create meaningful outcomes. When knowledge is shared, science has greater impact.



Nature's big questions:

Q5.

How is new technology driving solutions for nature?

A.

New tools and shared data platforms are opening up new ways to collaborate and new kinds of questions to ask. Scientists now use:

- artificial intelligence to analyse large environmental datasets to produce valuable insights
- advanced data modelling to explore what actions are needed to restore nature
- environmental DNA to detect species
- satellite imagery to understand landscapes.



The Shared Environmental Analytics Facility (SEAF), for example, turns complex data into insights to support environmental decisions. See seaf.org.au



Q6.

How does biodiversity science translate to real-world decisions?

A.

Scientific evidence from research informs how we manage landscapes, protect species, plan development and respond to environmental change. It can help:

- identify important habitats
- understand environmental risks
- improve restoration approaches
- guide sustainable land management
- measure whether actions are actually working.



Science turns big questions into knowledge and practical solutions that decision-makers can act on.



Nature's big questions:



Q7.

How does biodiversity science help us respond to the dual crises of nature loss and climate change?

A.

Nature loss and climate change are deeply connected, a changing climate accelerates habitat loss and species decline, while degraded ecosystems are less able to buffer against climate impacts like fire, drought and flood.

Biodiversity science tracks these shifts together: changing rainfall and fire regimes, climate refuges where species are more likely to persist and the ecosystems most at risk from both pressures at once.



Scientific evidence helps design restoration and conservation approaches built for the conditions ahead, not just the conditions of the past.

Q8.

What does success and positive impact look like?

A.

Biodiversity science delivers real impact when knowledge becomes action. It supports:

- better conservation outcomes
- improved restoration practices
- sustainable development
- reduced environmental risks
- stronger planning and management decisions.



The pathway from science to impact happens when knowledge is shared, understood and applied.

Nature's big questions:



Q9.

Who leads biodiversity science collaboration in WA?

A.

The Western Australian Biodiversity Science Institute (WABSI) is an independent collaboration mechanism for biodiversity science in WA. It brings together biodiversity science end users from government, industry and community, as well as researchers, to identify nature's big questions and the areas where knowledge is most needed. WABSI then coordinates the targeted research and translates the science into practical tools.



The WABSI research collaboration helps produce science that is relevant and the findings shared and applied where they are most needed.

Q10.

How can you get involved and be part of the future of biodiversity science?

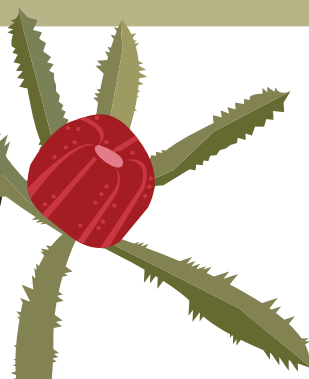
A.

The future needs curious minds asking big questions.
You can:

- participate in citizen science projects
- learn about local environments
- explore science subjects and careers in science, technology, conservation and environmental management.



Anyone can contribute to understanding and protecting nature.



Explore further:

From knowledge to action



Discover how The Western Australian Biodiversity Science Institute (WABSI) is helping answer some of Western Australia's biggest biodiversity questions.

Solving complex biodiversity challenges

Discover how collaboration and independent science are helping to identify what research we need to develop practical solutions for a changing world.



Using data insights for better decisions

Explore how data, analytics and technology are helping transform biodiversity information into practical insights.



For more information:
wabsi.org.au

