

The Knowledge Strategy sets priorities for the knowledge needed by the Office of Environment and Heritage (OEH) to support NSW Government and corporate objectives. *Biodiversity* is one of six 'knowledge themes' in the Knowledge Strategy.



Knowledge goal: Conserve biological diversity, ecological processes and systems

Biodiversity is the variety of life on earth (all plants, animals and micro-organisms). It encompasses genetic diversity, species diversity and ecosystem diversity. *Ecosystems* include species assemblages, habitats, processes and interactions with abiotic and human systems.

Outcomes

The *Biodiversity* knowledge theme aims to provide knowledge to:

- maintain plant communities, and healthy and resilient ecosystems
- support and provide information for land-use planning and management decisions
- protect biodiversity by managing threats
- maintain ecosystem services and processes through improved techniques for ecological restoration
- guide investment in conservation programs to areas of high conservation need.

Major OEH programs to address priority knowledge needs

Manage native vegetation more effectively

- OEH's Vegetation Information System is a comprehensive resource that helps landholders, planning authorities and regulators manage native vegetation. OEH is improving and promoting the system with better tools and knowledge.
- OEH supports decision-making for vegetation management at a landscape scale, by continuing to map NSW vegetation communities, and by analysing their resilience and patch connectivity.
- OEH scientists analyse satellite imagery to track annual changes in native vegetation cover and regrowth. This information supports strategic planning.

Improve ecosystem management through adaptive management science

- OEH uses adaptive management science as an iterative approach to management, based on explicit, experimentally based tests of management options and rigorous monitoring of outcomes.
- In collaboration with the Victorian Department of Environment and Primary Industries, OEH is undertaking an ecological thinning trial, in river red gum reserves in the Riverina which aims to improve wildlife habitat.
- OEH is helping to design and implement a grazing study in reserves where grazing already occurs in south-western NSW. The study will determine the environmental benefits and impacts of current grazing regimes.

Conserve species

- OEH is revitalising its program to recover threatened species. This will prioritise management actions and research for threatened species, ecological communities and populations, and key threatening processes. OEH has also developed projects to protect iconic species such as the malleefowl.
- OEH is investigating cost-effective methods to evaluate how threatened species respond to management actions that remove threats.
- *WildCount* is monitoring vertebrate animals in national parks to detect trends and changes over time.

Manage fire and invasive species

- *Living with Fire*, OEH's 10-year strategy to improve fire management in national parks, prioritises research needed to minimise the extinction risks of fire-sensitive species, while protecting life and property.
- OEH is updating the *Bushfire Environmental Assessment Code* with knowledge of how threatened species respond to fire. In addition, with the University of Wollongong, OEH is modelling how fires behave in a changed climate.
- OEH is studying the potential impacts of invasive species on biodiversity, national parks and local communities, to develop priority actions for Regional Pest Management Strategies.
- OEH is establishing a network to monitor the impacts of myrtle rust on selected coastal vegetation communities.
- OEH is assisting the Lord Howe Island Board with a major program to eradicate introduced rodents on the Island.

Opportunities to collaborate with OEH

OEH seeks collaborators and/or funding to address the following priority knowledge needs.

Understand the abundance and distribution of biodiversity

- Undertake mapping of threatened ecological communities at a fine-scale in priority areas, such as coastal Local Government Areas and areas with rapid land-use change, to inform management decisions.
- Conduct long-term monitoring to assess the distribution, population status, condition and trends of biodiversity, to prioritise management and conservation of:
 - threatened species
 - indicator species (where the species' status may reflect ecosystem health)
 - keystone species (species that, if removed, may lead to major ecosystem change)
 - invasive species
 - species subject to sustainable harvest.
- Improve genetic analyses of species and populations, to enable routine application of such analyses in conservation management.

Understand ecosystem services to better manage species

- Identify species that provide critical ecosystem services or hold major cultural or economic significance to inform management. Freshwater species are a particular priority.
- Study ecosystem dynamics and long-term ecological processes to improve understanding of how species, and plant and animal communities, respond to habitat fragmentation and contribute to ecosystem services.

Understand appropriate management actions and how to prioritise them

- Develop techniques to restore ecosystems, to build landscape and ecosystem resilience and help improve vegetation management.
- Undertake research and surveys to identify ways to improve the recovery of threatened species.
- Integrate information including spatial information from multiple sources so that conservation actions can be prioritised based on genetic, species assemblage and ecosystem-level data.

Understand the effectiveness of existing processes and tools to conserve biodiversity

- Study the capacity of protected areas to conserve biodiversity and enable biodiversity to adapt to climate change and altered water flows (flows that have changed from their natural state due to human activities).
- Gather data on population ecology and viability to inform impact assessments, and to model populations of threatened species and harvested species (such as kangaroos) more accurately.
- Comprehensively assess the conservation values of fauna and flora at local, regional and state scales to inform planning and other decision-making.
- Undertake research identified in the *Living with Fire* strategy, to improve the biodiversity outcomes and effectiveness of fire management in reserves.

More information

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