Waterbird monitoring

Monitoring of waterfowl, shorebirds, ibis and cormorants has occurred at the Western Treatment Plant since 2000, as part of an ongoing study to support the management of this 11,000 ha site by Melbourne Water. This area is of international importance as a habitat for waterbirds and is especially important during droughts. The waterbird monitoring program assessed whether recent upgrades in sewage and wastewater treatment affected waterbird numbers and patterns of habitat use. Results showed that season and climate appear to be the dominant influence on waterbird numbers at the site.

Dramatic declines of many species coincided with the end of the 'millennium drought' in 2009-10, when heavy rains and floods occurred across large parts of Australia, providing waterbird feeding and breeding habitat elsewhere. Populations at the treatment plant have since returned to 'normal' levels. This work highlights the importance of maintaining long-term monitoring to support conservation management.

Strategic management of rabbits

ARI led and delivered a large collaborative research project to investigate the most cost-effective techniques to restore a degraded, rabbit infested landscape in the upper Werribee River catchment. The program involved monitoring revegetation works, with and without rabbit control; and the results provided quantitative data to help guide investment decisions about rabbit control and revegetation. For example, tree guards were found to greatly increase plant survival with and without rabbit presence, but unguarded trees survived significantly better in areas where rabbits had been controlled. In areas where rabbits hadn't been controlled, less than 10% of unprotected tree seedlings persisted. These findings were published in the international journal, Ecosphere.

For land managers, this work will lead to better advice about the most cost-effective method of rabbit control and landscape restoration. Collaborators included the Department of Economic Development, Jobs, Transport and Resources, Melbourne Water, Port Phillip and Western Port CMA, Parks Victoria, Victorian National Parks Association, Greening Australia, and VicTrack.

Connectivity in Victorian waterways: wetlands and fishways

Connectivity refers to the ability of plants and animals to move across the landscape and reach suitable habitats – this is fundamental to the persistence of populations. ARI's aquatic scientists are working in two key areas of connectivity: dispersal of wetland biota and fish movement. They have developed a model of wetland connectivity at the state-wide scale to inform wetland policy and identify sites where restoration activities will have flow-on benefits to other wetlands through improved dispersal.

Fish ecologists have identified barriers to fish movement and identified the key design requirements of structures to enhance fish passage in Victorian waterways. Installation of these fishways has resulted in expansion of the range of many freshwater fish species in Victorian rivers.

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Arthur Rylah Institute for environmental research

Our History:

ARI was officially opened in 1970 by Queen Elizabeth II and Prince Philip. ARI has played an important role in the discovery of new species, such as the Long-footed Potoroo and several species of galaxiids, as well as the detection of new species within Victoria such as Gile's Planigale.

ARI's early broad scale surveys of fauna and flora were fundamental to documenting species distributions across the state. In more recent years the use of cutting edge techniques, such as camera traps, thermal cameras, electrofishing, acoustic and radio telemetry, PIT tags, remote sensing and world-class spatial mapping and modelling products, have enabled ARI to undertake innovative science to address applied management and policy problems.

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Arthur Rylah Institute for environmental research

Arthur Rylah Institute for Environmental Research

VICTORIA State Government | Environment, Land, Water and Planning

Arthur Rylah Institute for environmental research

The Arthur Rylah Institute for Environmental Research (ARI) is the leading centre for applied biodiversity research in Victoria.

About Us

We are the Victorian government's biodiversity research institute – part of the Biodiversity Division in the Victorian Department of Environment, Land, Water and Planning (DELWP). Our aim is to generate and share knowledge, through world-class, applied, ecological research. This knowledge supports and guides sustainable ecosystem policy and management to ensure healthy, resilient ecosystems in south-eastern Australia

Our Skills

Our highly skilled team includes over 65 committed, experienced research staff working in terrestrial and aquatic ecosystems to deliver robust, credible science to answer key environmental questions.

Most of our scientists have post-graduate qualifications and extensive experience. We have strong quality assurance procedures and our science is independently peer reviewed. Our scientists are supported by our efficient business and administration team.

We have expertise in:

- species and habitat assessment, monitoring and restoration
- ecological modelling, analysis and mapping
- taxonomy of plants and animals
- quantitative ecology and biometrics
- threatened species conservation and recovery
- population dynamics and population modelling
- disturbance ecology (e.g. fire, flood, flows, grazing)
- invasive species assessment, surveillance and management effectiveness
- developing, testing and implementing innovative survey techniques for biodiversity assessment
- developing robust indicators and decision support tools
- management of over-abundant native wildlife
- species distributional databases – input, review and interpretation of records (e.g. Victorian Biodiversity Atlas)
- science communication, engagement and citizen science.

Our Pillars

Robust Science

Innovative Technology

Meaningful Partnerships

Independent Science Review (2015):
"...world class... exceptionally strong work ...and a state-of-the-art modelling approach..."

Client feedback examples:

- High quality and responsive services.
- Very professional and diligent, great to work with.
- '... I would now rate ARI as one of the very best consultants to use in terms of communication and delivery of results (as well as their usual excellent science, of course).'.

Collaboration

We have strong relationships and partnerships both within and outside government. Our staff work closely with the Commonwealth Government, other state government departments and agencies, Catchment Management Authorities (CMAs), Melbourne Water, Parks Victoria, local municipalities, research institutes, commercial organisations, interest groups, non-government organisations and the community. We have extensive links with universities and our staff co-supervise post-graduate students across eight universities. We have a growing relationship with La Trobe University, with three co-appointed staff who provide science leadership and conduct joint research across both organisations.

Meeting Our Clients' Needs

We listen to our clients and recognise the importance of understanding their needs. We align our research programs and interpret our research into meaningful management guidance and focus on strong transferability of results to maximise their broader applicability. Feedback from an annual client satisfaction survey, within and outside government, helps us to continually improve project delivery. We are proud of our excellent results.

Sharing Our Work

We share our knowledge. ARI has a strong publication record, publishing more than 50 peer reviewed journal articles and more than 50 client or technical reports each year. This science is conveyed at a range of national and international conferences, regional seminars and workshops.

ARI is actively working to improve how we translate and share our science stories. We develop a range of products fit for purpose; from journal articles for the science community, reports and fact sheets for practitioners, to videos and webpages for engaging the community.

Our staff also run and participate in many field days, workshops and forums, and we evaluate the effectiveness of our engagement.

Arthur Rylah Institute for environmental research

Examples of Projects

These six projects provide examples of the breadth of work at ARI.

Mapping vegetation extent and condition across Victoria

It is very useful to understand what south-eastern Australia was like 200 years ago, to help agencies make informed decisions about habitat protection, restoration and rehabilitation for the future.

By using remote-sensed imagery, GIS data and custom-developed software to 'train' satellite, climate and ecological data into telling us a story of the past, ARI has built an 'Ecological Time Machine' that produces a pre-European-settlement 'satellite' image. It's not just a 'pretty picture' or a mock-up, it's far more useful and detailed than that (see DELWP YouTube channel, https://www.youtube.com/watch?v=5PBb2V5qd-Y).

Innovative survey methods to detect the critically endangered Leadbeater's Possum

ARI is using new approaches to detect Victoria's faunal emblem. This small arboreal species lives in the tall, wet forests of Victoria's Central Highlands, where it has traditionally been difficult to find. ARI has teamed with tree canopy specialists to install automated cameras high in trees, using creamed honey as a lure. Cameras are set on tree trunks up to 47 m above the ground, targeting areas of well-connected vegetation where animals are most likely to be moving or foraging. The cameras are retrieved four weeks later and the photographs examined.

When surveying at night we use thermal imaging cameras to detect the heat signature of the animals, which, when used in conjunction with imitating their calls, increases the chances of detecting them. These innovative survey methods have significantly increased our ability to locate Leadbeater's Possums more quickly and efficiently than in the past, enabling colonies to be protected from timber harvesting.

Environmental flow research and monitoring

ARI aquatic scientists are collaborating with DELWP policy makers, the University of Melbourne and CMA waterway managers to investigate the response of native fish and aquatic and riparian vegetation to environmental water management in regulated rivers across Victoria. The collaboration is forged through the Victorian Environmental Flows Monitoring and Assessment Program which has a key objective of demonstrating the ecological outcomes of environmental flows.

The assessment approach used in the program is based on conceptual models of the response of fish and vegetation to flows, key evaluation questions and multiple assessment rivers. Knowledge gaps in our understanding of ecosystem and population responses to environmental flows are also being addressed in this program.