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Toolibin Lake Catchment Recovery Plan 2015–35 Summary





WHERE WE'VE COME FROM

Toolibin Lake is an internationally significant wetland that lies within a series of class 'A' nature reserves managed by the Department of Biodiversity, Conservation and Attractions (DBCA). The lake lies within the Toolibin Lake catchment located about 180km south-east of Perth at the headwaters of the Northern Arthur River.

The catchment covers an area of 48,977ha and consists largely of long established agricultural country, with land first cleared for farming in the late 1890s. Today about 12 per cent

(6,024ha) of the catchment's original vegetation remains. Much of that remnant vegetation is now protected in the Toolibin, Dulbinig, Dingerlin and Walbyring nature reserves.

Management of the Toolibin Lake catchment to date has been focused on these reserves, guided by the recovery actions outlined in the first Toolibin Lake Recovery Plan released in 1994, and programs such as the *Natural Diversity Recovery Catchment Program* since 1996. These actions have been integral in helping to recover and protect significant biological communities,

particularly wetlands, from altered hydrology at a catchment scale within southern agricultural areas. The wandoo woodland, located on private property, and Taarblin Lake Nature Reserve, located just outside the catchment boundary, are also of management interest.

The *Toolibin Lake Catchment Recovery Plan 2015–35* builds on the previous plan's recovery actions and adopts a planning approach that concentrates recovery activities on maximising the values people can derive from the biological elements of the catchment.



Front cover main Toolibin Lake. Inset (top left) Snail orchid. Inset (top right) Pink eared ducks. Photo – Roz Barber
Top Dulbinig Nature Reserve woodland community. Above left Aerial view of Toolibin Lake. Above right Toolibin Lake.



THE NATURAL DIVERSITY OF TOOLIBIN

Toolibin Lake catchment is of considerable value to the community of Western Australia due to the area's remarkable diversity of natural flora and fauna, some of which are rare and/or threatened. The catchment features the critically endangered '*Melaleuca strobophylla-Casuarina obesa*' threatened ecological community (TEC) listed under the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999*, and has been listed and endorsed by the WA Minister for Environment as critically endangered. These occurrences of this community are some of the last examples of a once-widespread and common vegetation type.

Toolibin Lake is surrounded by woodlands and shrublands of eucalypt, melaleuca, acacia, sheoaks and, on the sandy sites, by banksia. The wetland provides a quality habitat for a wide range of waterbirds. This has contributed to Toolibin Lake being listed as a Wetland of International Importance under the Ramsar Convention. There are several additional wetlands within the Toolibin Lake catchment including Walbyring Lake and Dulbining Lake (both also listed as the same type of TEC) and two unnamed lakes that are of similar type.

During extended periods of surface water (more than six months), the lakes

in the catchment provide breeding and feeding habitat for migratory waterbirds, including the freckled duck (*Stictonetta naevosa*), which has a very small breeding population in south-west of Western Australia. The lakes also support breeding colonies of cormorants, egrets, night herons and spoonbills which are otherwise scarce or absent in the inland agricultural area of the south-west Australia.

In addition to the important biological elements associated with Toolibin Lake's Ramsar and TEC status, the surrounding area boasts more than 300 natural plant species and 10 natural mammal species as well as a wide diversity of insects, reptiles, amphibians and terrestrial birds.



OUR COMMUNITY

The *Toolibin Lake Catchment Recovery Plan 2015–35* incorporates input from stakeholder representatives, government, non-government, and community groups through the Toolibin Lake catchment recovery team and technical specialist advice. Both groups are involved in the ongoing planning and implementation of management actions within the catchment.

Landholder support for the conservation of the biological elements is critical as much of the catchment incorporates private property used primarily for farming. Recovery actions will need to take into consideration local aspirations, including the need for landholders to continue their agricultural business through economically viable, sustainable land use. It is anticipated that landholders in the future will be living and working with modern farming systems, in a

drying climate and in some cases taking a different approach to conservation than has been done in the past.

Community consultation and engagement are recognised as important components of catchment management. Members of the community, educational institutions and other interest groups play an important role in collecting information about the natural systems of the catchment. Landholders can manage their lands by taking into consideration the needs of the biological elements of the catchment and the values derived from them, as well as benefiting from management practices that improve catchment health and the productivity of their lands. Catchment management achievements will be communicated through a biannual newsletter, excursions for educational

institutions and other interest groups, and representation at conferences and regional shows.

Realising the goal for the Toolibin Lake catchment will require actions that bring together a diverse set of land-use issues and a variety of stakeholders in a collaborative and focused way. The implementation of this plan will provide opportunities for stakeholders to:

- access new knowledge relating to the management of catchment-scale hydrology
- attract funds for on-ground works to integrate sustainable agriculture with the conservation of biological elements
- contribute to identifying and implementing solutions to land degradation
- conserve natural biota for future generations.



Above DBCA staff addressing TAFE students. **Above top right** DBCA staff and volunteer seed collecting. **Above right** Ecophysiology experiment on plant water use at Toolibin Lake.

WHAT WE HAVE DONE

A number of successful activities have been completed since the inception of the first Toolibin Lake recovery plan. These recovery activities aimed to address a number of issues, particularly relating to altered hydrology, which is a key threatening process impacting on the biological elements.

Broadscale clearing of natural vegetation, and its replacement with crops and pastures that use less water, has led to changes in the water balance and accelerated salt loads resulting in secondary salinisation of the catchment's lands and wetlands.

Recovery actions to date have successfully contributed to protecting the catchment's wildlife and preventing declines in the wetland vegetation. However, managing key threatening processes, such as altered hydrology, will require ongoing effort.

Achievements include:

- a measurable improvement in the survival and regeneration of key plant species on the Toolibin Lake floor and in the surrounding areas
- with favourable weather conditions, waterbirds are still likely to visit and breed at Toolibin Lake and the surrounding wetlands as observed during previous fill events
- the implementation of surface water management infrastructure has regulated surface water so that high saline flows are now diverted away from the lake and its surrounding nature reserves
- the installation of a groundwater pumping system, coinciding with an extended period of low rainfall, has resulted in decreased groundwater levels



- broadscale revegetation around the wetlands on the surrounding nature reserves and private property within the catchment
- implementation of a long-term, consistent and intensive hydrological monitoring program, with collected data fed into sophisticated models that guide management actions
- in 2002 the Toolibin Lake recovery team and technical advisory group (TAG) were recognised and awarded the IEAust National Salinity Prize for innovation in dealing with salinity.

As a result of these management interventions, and aided by a drying climate in recent decades, the broad conservation values of Toolibin Lake and the surrounding reserves have been maintained despite severe pressure from altered hydrology.



Above Opening of diversion gates at Toolibin Lake. **Above right** Planting at Millers Reserve.

THE PLANNING FRAMEWORK AND THE RECOVERY PLAN

1 In summary, a total of 14 vegetation elements and seven fauna elements were identified by stakeholder representative and technical expert groups as the basis for assessing human values. In line with the strategic approach of the recovery catchment program, only biological elements most susceptible to the impacts of altered hydrology were considered. Catchment stakeholders identified three key human values:

- Knowledge and education: The Toolibin Lake catchment is used by a wide range of educational groups (primary, secondary and tertiary) as a living classroom and research area. The knowledge arising from continued research in the catchment makes an important contribution to improved

learning of environmental change and its management throughout south-western Australia.

- Productive use: Biological elements contribute directly to productive land use by lessening the downstream impact of salinity and other processes degrading agricultural soils.
- Philosophical and spiritual contentment: The catchment has been significantly affected by human activity and the remaining biological elements are representative of systems that were once widespread, but which have now largely disappeared. Stakeholders feel an ethical responsibility to protect these remnant systems for present and future human generations.



2 Based on the values arising from the biological elements by the stakeholders, and endorsement by the recovery team the recovery catchment goal is:

To maintain or improve the knowledge/heritage and education; productive use; and philosophical/spiritual contentment values provided by the specified natural biological elements for the next 20 years.

3 Twenty-one biological elements in the catchment were identified as important to deliver the key values. Toolibin Lake and waterbird elements are the primary focus of management, although all the nature reserve and wetland elements are also particularly valuable.

4 Identifying the key threatening processes affecting the likelihood of achieving the goal was an essential step towards defining the required management actions. Risk analyses identified altered hydrology, problem species and inappropriate fire regime as the key threatening processes that require management to minimise the likelihood that natural species are lost.

- Altered hydrology - catchment-scale changes to the water balance has created a water surplus, which manifests as persistent surface water run-off and groundwater recharge. Both processes provide more water, and water with generally higher salinities, to the biological elements within wetland systems. A drying climate has changed some aspects of groundwater and surface water behaviour and this has presented significant additional issues that require ongoing research and the development of adaptive management strategies.
- Problem species
 - Weeds; once established, competitively superior weed species present a threat to many of the natural plant species. Weeds compete with native vegetation for nutrients, sunlight and water, can have an allelopathic effect on native plants, or be toxic to native animal species (e.g. slender ice plant). Native vegetation is already under pressure from a range of threatening processes and the impact of weed invasion can have a compounding effect on the quality of native vegetation and habitat.
 - Pest animals; heavy browsing by kangaroos has resulted in stunted *Casuarina obesa* plants, making them unlikely to reach reproductive maturity. Rabbits are also having a significant impact on the regeneration of native

vegetation and seedlings planted for revegetation projects. They also disperse viable weed seed through their scats, and their latrines and warrens provide productive sites for weed establishment.

- Disease; Dieback (*Phytophthora cinnamomi*) and other plant diseases can irreparably change the structure and composition of some vegetation communities by eliminating susceptible native plant species, and therefore their value as fauna habitat. Newly identified species of *Phytophthora* have been detected in the catchment and the extent of their impact on native vegetation is currently unknown.
- Fire regime – Altered fire regimes due to changed land use and climatic conditions may affect the plant diversity within the vegetation elements, especially for plant species dependent on fire. Different species vary in their sensitivity to changes in the frequency, timing and intensity of fires, and an understanding of the fire response of most species, such as germination triggers, age to maturity, life span, and rate of seed bank decline, is required to inform fire management practices.

5 A series of possible recovery options were compared and prioritised relative to their contribution to the human values. Altered hydrology rated the highest followed by problem species and then inappropriate fire regime. A five year works plan has been developed for the implementation of recommended actions which address the key threatening processes.

6 An adaptive monitoring program has been developed to allow managers to monitor the status of the biological elements and the threatening processes over the management period. It aims, firstly, to garner important management and recovery information and, secondly, to trigger new recovery responses should they be required.



Above right Toolibin Lake. *Photo – Lyn Alcock* **Back cover** Road reserve within the catchment.

WHERE TO NEXT

The recovery plan will be implemented in accordance with a five-year works plan and annual operational planning and works by the catchment team in partnership with the community. It will include annual reporting on expenditure and outputs, and progress reports. This will be complemented by periodic major reviews.

FOR MORE INFORMATION

Visit the website dca.wa.gov.au to download full versions of the plan.

Contact Parks and Wildlife Service at the Department of Biodiversity, Conservation and Attractions Wheatbelt regional headquarters in Narrogin on (08) 9881 9200.

This document is available in alternative formats on request. All photos – DBCA unless otherwise specified.



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