州的流域 2010

湿地

猎人-中央河区域

州计划目标

到2015年，重要湿地的状况有所改善，湿地的面积保持不变。

背景

猎人-中央河区域涵盖大略37,000 km²的新南威尔士州东海岸。该地区包含多种湿地类型，如高地沼泽、海岸洪泛区沼泽和海岸沼泽，以及海岸沙丘湖和泻湖。

总体而言，猎人-中央河区域的湿地状况非常差。该地区的最大压力来自食肉动物栖息地的破坏，以及靠近或穿过湿地的沿海带和道路以及休闲设施。

注：所有关于自然资源状况、压力和管理活动的数据均包含在2010年SOC报告中，以及用于编制SOC报告的技术报告中。这些数据收集至2009年1月。


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Specific sites have been mapped for this report as NSW wetlands are neither comprehensively nor consistently mapped. The state target specifies that only ‘important’ wetlands be assessed; the sites reported on in this document are therefore internationally, nationally and regionally important but may not be representative of all wetlands in the region.

The state target reports only on freshwater wetlands in NSW and does not include riverine, estuarine or tidal wetlands.

**Condition**

Wetland ‘extent’ refers to the condition of the inundated area and the vegetation that depends on it. A state-wide methodology is currently being developed by DECCW to determine the minimum and maximum extent of each wetland. Until this method has been developed and consistent mapping is carried out for all regions, the extent of NSW wetlands cannot be compared or comprehensively reported on.

**Indicators of condition**

In general, there is a lack of available data on the condition of NSW wetlands and very few procedures or standards for collecting and analysing such data.

For the purposes of this report, ‘indicators of condition’ have been combined for each wetland (without weighting) to produce an overall ‘condition rating’ (see Table 1). This provides an overview of the wetlands within the region and may prove useful when devising a formal methodology to assess wetlands in NSW. The value of this condition rating depends to a very large extent on the
data on individual indicators; in many cases the ‘indicator of condition’ is based on very limited data, in some cases on pest species alone, so the overall indicator should be regarded with some caution.

Measured in the fringing zone and/or wetland, the indicators of condition assessed for the 12 most significant wetlands in the Hunter–Central Rivers region were:

- **biological condition** – the response of the wetland flora (eg aquatic and fringing vegetation) and fauna (eg birds, fish and invertebrates) to pressures on the ecosystem. It can be a measurement of the abundance or health of these plants and animals or a combination of both; there is currently not much data available for many of these indicators and additional data will need to be collected in future

- **pest species** – the ratio of native to introduced species of flora and fauna

- **water quality** – the condition of the water in the wetland. Water quality takes into account pH, salinity and turbidity; data can be very difficult to analyse as results can be highly variable. Analysis of a wetland’s water quality is important as the water supports biota and ecological processes within the ecosystem

- **soil condition** – the physical attributes of the wetland including pH, salinity, soil moisture, erosion and modifications such as channelling works. Wetland soils contain nutrients that form the base of the food chain and store seeds and eggs of flora and fauna.

### Table 1  Indicators of condition and overall condition rating for wetlands in the Hunter–Central Rivers region

<table>
<thead>
<tr>
<th>Wetlands</th>
<th>Condition</th>
<th>Trend</th>
<th>Data confidence</th>
<th>Biological condition</th>
<th>Pest species</th>
<th>Water quality</th>
<th>Soil condition</th>
<th>Extent (hectares)</th>
<th>Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Hunter–Central Rivers wetlands</td>
<td>?</td>
<td>L</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall NSW wetlands</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barrington Tops Upland swamp</td>
<td>?</td>
<td>L</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>176.84</td>
<td></td>
</tr>
<tr>
<td>Cattai Wetlands Coastal floodplain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>357.41</td>
<td></td>
</tr>
<tr>
<td>Darawahk Coastal floodplain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>959.08</td>
<td></td>
</tr>
<tr>
<td>Ellalong Lagoon Coastal freshwater lake</td>
<td>?</td>
<td>L</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>340.7</td>
<td></td>
</tr>
</tbody>
</table>
Indicators of condition vary between wetland types; some indicators of condition do not apply to certain wetland types or may be scored differently between types. Various data is not available due to reasons such as a lack of raw data, lack of information on how to score certain indicators and no long-term datasets to appropriately score the indicator.

Condition indicators, such as invertebrates and vegetation, would be appropriate if data and standards were available. These will continue to be developed for future reporting cycles.
Condition variables

Many variables were taken into account when calculating condition scores. Where relevant, the following variables were considered during analysis of the Hunter–Central Rivers region wetlands:

- **biological condition** – tree health
- **pest species** – ratio of native to introduced plants, ratio of native to introduced animals
- **water quality** – total nitrogen load (kg/ha/yr), total phosphorus load (kg/ha/yr), total nitrogen (µg/L), total phosphorus (µg/L), number of algal blooms, turbidity (NTU), ambient pH, salinity (EC)
- **soil condition** – ambient pH.

For detailed information on which variables were used to calculate the condition scores and how they were scored, aggregated and weighted, please see the supporting technical report.

Pressures

There are a variety of ‘pressures’ or disturbances that adversely impact on wetlands and ultimately affect the overall condition rating. As was the case with condition assessment, a methodology has not yet been formulated to determine the pressures on individual wetlands across all NSW.

Indicators of pressure

For the purposes of this report, the following ‘indicators of pressure’ have been combined (without weighting) to produce an overall ‘pressure rating’ (see Table 2).

Measured in the fringing zone, wetland and/or hydrological catchment, the indicators of pressure assessed for the 12 most significant wetlands were:

- **catchment disturbance** – modifications or changes to the catchment structure or processes that affect the wetland. Significant catchment disturbances affecting NSW wetlands include urbanisation, agriculture, vegetation clearing, infrastructure and fire
- **hydrological disturbance** – the levels of nutrients entering a wetland, water and soil chemistry, vegetation patterns, the biota present and the wetland’s productivity. Drainage, damming, extraction and river regulation have greatly altered the hydrologic dynamics of many NSW wetlands
- **habitat disturbance** – both the direct removal of wetland habitat and activities that modify, damage or disturb wetland habitat areas. Disturbance to a habitat may include construction work, urban development, clearing for agriculture, recreational uses and water regulation.
### Table 2  Indicators of pressure and overall pressure rating for wetlands in the Hunter–Central Rivers region

<table>
<thead>
<tr>
<th>Wetlands</th>
<th>Pressure</th>
<th>Trend</th>
<th>Data confidence</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Catchment disturbance</td>
</tr>
<tr>
<td>Overall Hunter–Central Rivers wetlands</td>
<td></td>
<td></td>
<td>L</td>
<td></td>
</tr>
<tr>
<td>Overall NSW wetlands</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barrington Tops Upland swamp</td>
<td></td>
<td></td>
<td>L</td>
<td></td>
</tr>
<tr>
<td>Cattai Wetlands Coastal floodplain</td>
<td></td>
<td></td>
<td>L</td>
<td></td>
</tr>
<tr>
<td>Darawahk Coastal floodplain</td>
<td></td>
<td></td>
<td>L</td>
<td></td>
</tr>
<tr>
<td>Ellalong Lagoon Coastal freshwater lake</td>
<td></td>
<td></td>
<td>L</td>
<td></td>
</tr>
<tr>
<td>Hexham Swamp Coastal floodplain swamp</td>
<td></td>
<td></td>
<td>L</td>
<td></td>
</tr>
<tr>
<td>Moffat’s Swamp Groundwater</td>
<td></td>
<td></td>
<td>L</td>
<td></td>
</tr>
<tr>
<td>Eurunderee Lagoon Coastal dune lake and lagoon</td>
<td></td>
<td></td>
<td>L</td>
<td></td>
</tr>
<tr>
<td>Myall Floodplain Coastal dune swamp</td>
<td></td>
<td></td>
<td>L</td>
<td></td>
</tr>
<tr>
<td>Wentworth Swamp Coastal floodplain swamp</td>
<td></td>
<td></td>
<td>L</td>
<td></td>
</tr>
<tr>
<td>Wyong Racecourse Wetlands Coastal rainfall swamp</td>
<td></td>
<td></td>
<td>L</td>
<td></td>
</tr>
<tr>
<td>Colongra Swamp Coastal rainfall swamp</td>
<td></td>
<td></td>
<td>L</td>
<td></td>
</tr>
<tr>
<td>Jewells Wetland Coastal heath swamp</td>
<td></td>
<td></td>
<td>L</td>
<td></td>
</tr>
</tbody>
</table>
As was the case with indicators of condition, some indicators of pressure do not apply to certain wetland types or may be scored differently between types. Likewise, various data is not available due to reasons such as a lack of raw data, lack of information on how to score certain indicators and no long-term datasets to appropriately score the indicator.

**Pressure variables**

Many variables were taken into account when calculating pressure scores. Where relevant, the following variables were considered during analysis of the most significant wetlands in the Hunter–Central Rivers region:

- **catchment disturbance** – catchment cleared (%), wetland adjoining urban areas (%), infrastructure, presence of point sources
- **hydrological disturbance** – number and type of impoundments, river regulation, farm dam density, number of groundwater bores, density of irrigation channels
- **habitat disturbance** – recreational use (e.g., camping, boat ramps, parks), lakebed cropping, grazing, pugging, travelling stock routes, roads crossing and/or adjoining the wetland, wetland in a protected area (%), barriers without fish passage, presence of feral animals.

For detailed information on which variables have been considered when calculating the above pressure scores and how they are scored, aggregated and weighted, please see the supporting technical report.

**Management activity**

Addressing the wetlands target in the Hunter–Central Rivers region involves implementing a number of policies and programs at both a state and regional level, which will result in the improved condition of Hunter–Central Rivers and other NSW wetlands.

**State level**

The wetlands target is being addressed at the state level in numerous ways:

**Policy**

- The draft NSW Wetlands Policy provides clear and consistent principles of management for the improvement and protection of the state’s wetlands. It also aims to increase the capacity for a coordinated, cross-government approach to wetland conservation.
**Protection and rehabilitation**

- The NSW Wetland Recovery Program (WRP), NSW Rivers Environmental Restoration Program (RERP) and NSW Riverbank Project aim to deliver long-term and permanent benefits for ecologically significant wetlands. These programs achieve such benefits through water efficiency projects, water buy-back and projects to improve wetland management. The WRP and RERP Programs are joint initiatives with the Australian Government.

- There is continuous protection and conservation of wetlands under conservation agreements and on public reserves, in wildlife refuges and on various other private and public lands.

- The 2008–2018 NSW National Park Establishment Plan lists wetlands as a priority.

- A saltwater wetland rehabilitation manual has been finalised by DECCW.

- There has been contribution to the Hunter catchment water sharing plans and the review of environmental flow requirements for the Hunter estuary.

- There has been support for, and management of, projects for restoration of river red-gum populations in the Hunter Valley, in association with Hunter–Central Rivers Catchment Management Authority (CMA) and various coal mining companies.

**Research**

- Research into the river-red gum populations in the Hunter Valley has been undertaken in association with mining companies and University of Newcastle.

**Monitoring, evaluation and reporting**

- The NSW Integrated Monitoring of Environmental Flows measures changes in environmental flows and ecosystem responses and provides information to improve wetland conditions.

- An ecological character description (ECD) is being prepared for the Kooragang component of the Hunter estuary Ramsar site. The ECD will help assess the degree of change in ecological character from 1984 (when the site was Ramsar-listed) onwards.

- An ECD for the Myall Lakes Ramsar site is being prepared. The ECD will identify gaps in data and monitoring priorities, which will subsequently improve the management of the site.

**Regional level**

At the regional level, the Hunter–Central Rivers CMA is undertaking various activities to achieve the state target. Specific examples include:

- A wetland mapping and classification project to identify priority wetlands for protection and rehabilitation. Initial investment has been made into a number of priority wetlands.

- The Kooragang Wetland Rehabilitation Project, a flagship project of the Hunter–Central Rivers CMA. It focuses on protecting and rehabilitating key estuarine saltmarsh and mangrove habitats in the lower Hunter Estuary for a range of threatened species, particularly internationally-significant migratory waders and shorebirds.

- The Hexham Swamp Rehabilitation Project, which aims to return 750 hectares of degraded, freshwater wetlands to tidal saline wetlands. This will be achieved through improved management of the Ironbark Creek floodgates.

- Funding to Wyong and Lake Macquarie councils to undertake saltmarsh rehabilitation projects in estuaries.
Local level

Improved outcomes for wetlands are achieved at a local level through:

- Wyong Shire Council and Gosford City Council, who are undertaking estuarine wetland remediation activities aimed at restoring saltmarsh habitats
- Hunter Wetlands Centre Australia, who is developing and protecting Ramsar wetland habitat for a range of threatened migratory wader and shorebird species.

Further reading


Fairweather PG & Napier GM 1998, Environmental indicators for national state of the environment reporting – inland waters, Australia: State of the environment (Environmental Indicator Reports), Department of the Environment, Canberra.


Scheltinga D & Moss A 2008, A framework for assessing the health of, and risk to, Queensland’s lacustrine (lake) and palustrine (swamp) wetlands, Queensland Environmental Protection Agency.


