REGIONAL
STATE OF THE ENVIRONMENT

2012

SUMMARY

for the Northern Rivers
Catchment Management
Authority region of NSW

NSW GOVERNMENT | **Catchment Management Authority** Northern Rivers

Acknowledgements

Regional State of the Environment 2012

Special thanks

Participating Councils

The authors would like to acknowledge the traditional custodians of the land reported on, including the Bundjalung, Yaegl, Gumbaynggirr, Dunghutti, Biripi, Nganyaywana and Ngarabal nations and their people, and pay respect to the Elders past and present of these nations.

Summary

This *Regional State of the Environment 2012* (Regional SoE) is the first for the Northern Rivers CMA region of NSW. It aims to:

- report on environmental condition at both a regional level and a local level for the 2011–12 financial year

- satisfy the requirements of the *Local Government Act 1993*, which requires a state of the environment (SoE) report in the year of an ordinary election

- provide environmental benchmarks for councils and natural resource managers to make informed decisions.

Preparation of the Regional SoE involved collaboration between 12 participating councils from Port Macquarie-Hastings in the south to Tweed in the north, including Kyogle and Lismore, three county councils, the Northern Rivers Catchment Management Authority (CMA), and a number of NSW government agencies.

Using a condition–pressure–response format, the Regional SoE reports on four key themes: People and the Environment, Biodiversity and Vegetation, Land use and Soils, and Water. Each theme has a number of resource categories with indicators and measures that were developed by the project working group specifically for the report.

The Regional SoE utilises both state and local data. State data is used to report on the Northern Rivers CMA Region ('CMA Region'). Local-level data is used to report on the council region which is made up of the 12 participating local government areas ('reporting region'). Figure 1 shows the location of these regions. Use of a range of data sources allows identification of regional- and local-level environmental condition, data gaps, and areas for further research, investigation and management.

Photo: Koala at rest Photo by: N Cotsell

Figure 1: Councils participating in the Regional SoE 2012

1. PEOPLE AND THE ENVIRONMENT

During 2011–12 the CMA Region experienced record-breaking rainfall, lower temperatures and widespread flooding due to the La Niña cycle, which impacted water quality and river health.

The 2011 Census revealed population increases above the NSW average in Tweed, Port Macquarie-Hastings and Coffs Harbour local government areas (LGAs) when compared to 2001 population figures. Bellingen and Kyogle LGA populations decreased from 2006 figures, and others showed little change. The trend is for higher population growth in major regional centres indicating employment, industry and economic growth are influencing population change. Population density is highest in Ballina at 80 people per square kilometre, and lowest in Kyogle at 2.6 people per square kilometre.

Nationally, annual greenhouse gas emissions are currently 546.8 megatonnes of carbon dioxide equivalent (CO_2-e), primarily contributed by transport and agriculture. Levels are slowly increasing. Locally, electricity consumption is fairly consistent across the reporting region, with an average of 7.6 tonnes CO_2-e emitted per person. The lowest emitter was Kempsey LGA at 5.8 tonnes CO_2-e per person, and the highest was Clarence Valley LGA at 10.2 tonnes CO_2-e per person. Council use of fuel, electricity for council assets and for streetlighting, revealed Byron Shire to be the lowest emitter overall at 0.12 tonnes CO_2-e per person, and Kempsey the highest at 0.32 tonnes CO_2-e per person.

Renewable energy accounted for 1.5% of total electricity consumption for 2011–12 across the reporting region, producing 61 gigawatt hours of electricity and saving

54,890 tonnes of CO_2-e. Ballina and Tweed LGAs had the highest number of houses with solar power in the region (and second highest in NSW), with up to 21% of houses having solar power.

Conversion of landfill gases to energy, streetlighting upgrades, solar power installation, fleet conversions and building retrofits by councils have resulted in at least 31,464 tonnes of CO_2-e being saved by Councils in the reporting region for 2011–12.

Water consumption across all LGAs within the reporting region has remained steady over the past two years, with an average consumption of 248 kilolitres per connection. Waste generated per person shows a slight overall decrease for the past two years (2%), with a 5% decrease in waste sent to landfill, a 2% increase in recycled waste, and a 9.2% increase in green waste diverted from landfill. Overall, each person in the reporting region sent 624 kg of waste to landfill, and recycled 521 kg waste in 2011–12.

Photo 1: Bellwood, Nambucca Heads, NSW. Photo by: J Ashby
Photo 2: Swamp sclerophyll forest, NSW. Photo by: S Ruming

2. BIODIVERSITY AND VEGETATION

Vegetation condition in the CMA Region is rated as fair, with 21.8% relatively natural and undisturbed and 40.4% modified but relatively intact. At the LGA level, Clarence Valley has the highest native vegetation cover at 75%, with Kempsey and Port Macquarie-Hastings at 73% and Bellingen at 71%. The northern LGAs of Ballina, Lismore and Byron had lower cover at 20.5%, 24.6% and 37% respectively, highlighting the impact of historical clearing of arable land for agriculture and for timber. Vegetation quality as species habitat (i.e. effective habitat area, EHA) was highest in the same LGAs as for native vegetation cover, however, Bellingen had the highest overall EHA (6,311 ha), and Lismore the lowest (3,287 ha).

Vegetation change and clearing information for 2011–12 is not yet available, but data from 1988 to 2010 from the Statewide Land cover and Trees Study (SLATS), which monitors change in woody vegetation using satellite imagery, shows that 2.2% of the CMA Region has had vegetation removed during this time, with 50% of that due to forestry harvesting operations (primarily state forest and private forestry), 27% due to agriculture, 17% due to fire, and 5% due to infrastructure maintenance. Generally, vegetation loss in the reporting region is related to state forest harvesting operations.

Native vegetation and biodiversity protection and restoration is governed by a number of policies and plans at national, state, regional and local levels. In 2012, there were 4 national plans, 8 state plans, 6 regional plans, and 7 local plans in place to manage biodiversity and vegetation. Each Council also has its own suite of policies, plans and programs to manage biodiversity.

Over 606 hectares of land (terrestrial) habitat restoration was carried out by councils in the reporting region for 2011–12, most with the assistance of external grant funding and volunteers. A total of 934 hectares was completed under CMA funding across the CMA Region. Volunteer contribution was essential for many habitat restoration projects but was vastly underestimated. At least 30,000 volunteer hours were contributed to habitat restoration in 2011–12. Land holders also contributed to restoration and improved land management, with 345 landholders implementing natural resource management knowledge and skills during the reporting year.

National parks and nature reserves protected 22% (1,102,595 hectares) of the CMA Region in 2012. Each council area protects land under their local environment plan (LEP) in addition to national parks. In 2012, over 163,000 hectares was protected under environmental zoning in LEPs for the 12 reporting councils, although at the time of this report some zonings are only in draft form and may change. At the landholder level, 9,759 hectares of private land were under permanent conservation agreements and 33,745 hectares under non-perpetual conservation agreements throughout the CMA Region.

The CMA Region has 448 threatened species, with 16 critically endangered, 5 extinct, 5 endangered populations, 185 endangered species, and 18 ecologically endangered communities. The CMA Region has 34 of the 35 identified terrestrial key threatening processes (KTP), and six of the seven aquatic KTPs in NSW. The LGAs of Clarence Valley and Richmond Valley have the highest number of endangered species to manage at 331 and 263 respectively, with Bellingen and Nambucca having the lowest at 201 each.

Invasive species, including weeds and animals, have a strong presence in both the CMA Region and the reporting region. In 2011–12 nearly 6,497 hectares of high risk weed sites and over 8,000 km of high risk pathways were treated. Evidence of reduced weed impacts was apparent across nearly 9,000 hectares of high priority sites. There is little local level information on the distribution and abundance of vertebrate pests in the CMA Region. All vertebrate pests listed as key threatening processes in NSW are found in the Region, and each LGA has some type of program in place to assist with control of a variety of vertebrate pests, including cane toads, Indian myna, fox, wild dogs, pigs, feral horses, deer, cats, carp, rabbits and wild roosters.

Photo 1: Mangrove seedling. Photo by: Nigel Blake
Photo 2 by: Nigel Blake

3. LAND USE AND SOILS

Soil condition in the CMA Region in 2012 is rated as 'fair' (noticable loss of soil function) to 'good' (slight loss of soil function), however, organic carbon and sheet erosion are in decline and are key issues for management. Land management is rated as fair to good across the CMA Region, but acidification and sheet erosion are primary land management issues, as is overall management of acid sulfate soils. Kempsey Hills have particularly poor scores for sheet and gully erosion, and Clarence sodic soils rate poorly for acidification and salinity. In 2012, nearly 5,000 hectares of land was under soil improvement and erosion controls, and 1,680 hectares was being managed for sustainable land management.

Acid sulfate soils (ASS) are being remediated across many of the coastal council areas. Comprehensive remediation has been achieved in Port Macquarie-Hastings and Clarence Valley LGAs, and in the Richmond River where the Richmond River County Council has remediated ASS within the Lismore, Richmond Valley and Ballina LGAs. Tweed and Kempsey LGAs have also remediated some ASS within their regions. Within the CMA Region, a total of 18,521 hectares of ASS have been remediated to date, in addition to 2,349 hectares of associated wetlands and 422 km of drains.

Photo: Tree roots Photo by: Nigel Blake

4. WATER

Freshwater and estuarine river condition has been difficult to determine due to the lack of comprehensive studies across the CMA Region or within individual LGAs. Available data on water quality, aquatic macroinvertebrates, riparian vegetation and fish assemblages indicate varying condition across the reporting region.

Water quality data for four LGAs indicates freshwater reaches of rivers are cleaner and less impacted than their estuaries, which are impacted by urban development, pollutants and sediment loads. Freshwater rivers are rated as 'good' (most habitats are intact), with estuaries rated as 'fair' (mildly impacted habitats). NSW monitoring of CMA region estuaries indicates 84% of estuaries rated as 'good' or 'very good' for turbidity, and 47 % for chlorophyll-a levels (over 50% of samples passed the guidelines).

Monitoring of aquatic **macroinvertebrates** (water bugs) indicates the CMA Region is performing well generally, with 65% of sites scoring 'A' (the expected number of invertebrate families found) or above, and less than 10% of sites and samples performing poorly indicating severely impaired habitats.

Recent assessment of **fish condition** shows there is low impact from pest fish species, but the number of native fish species (expectedness) is poor in the highlands regions of all river systems in the CMA, and recruitment (the number of young for each fish species) is poor. Estuaries were generally rated as 'good' for number of native fish species across the region, meaning most of the expected species were present.

Riparian vegetation condition is difficult to assess due to lack of data, but is a high priority for assessment due to its importance for aquatic species. NSW data indicates 65-82% of estuarine riparian vegetation has been disturbed across the major estuaries in the CMA region. However, smaller estuaries withion national parks have less than 1% disturbance. Data from Ecohealth assessments across three different LGAs indicates riparian vegetation is in 'fair' to 'poor' condition (vegetation is mild to moderately impacted). Additional data gathered by councils indicates that in Ballina LGA 42% of riparian vegetation is in 'good' condition, in the Clarence River system 85% is in 'good' condition outside the floodplain area, although within the floodplain area only 2% is in 'good' condition. This area remains lacking in quality condition data and it is hoped further comprehensive studies on riparian vegetation condition at a local level can be conducted by the next SoE report in 2016. Restoration work on riparian areas has been carried out on over 570 hectares and involved weed removal and planting, often with grant funding, volunteer assistance, and landholder involvement.

Waste water treatment plants (WWTP) across the reporting region currently discharge 46,494 megalitres (90.4%) of treated waste water into waterways, and reuse nearly 5,000 megalitres (9.6%). Improvements in waste water treatment will improve the quality of discharged water, and all LGAs are investigating options to increase waste water reuse. Assessment of on-site sewage management systems (OSMS) such as septics, indicates a failure rate across LGAs of between 4% and 60%, and an issue with the high number of unregistered systems. As malfunctioning septics have caused closures of oyster growing areas in some of the CMA Region's rivers, better identification of septics considered to pose a risk to waterways is required. Some LGAs have implemented comprehensive septic mapping and management priority plans, but many others do not have the resources to do this. Increased resourcing for this purpose is recommended.

Stormwater management varies across the reporting region. Water sensitive urban design plans and specific stormwater management plans are in place for 7 of the 12 reporting councils. Some have provisions for stormwater management in their local environment plan or in development control plans and some have no specific provisions. Stormwater improvement works for 2011–12 in the reporting region totalled nearly $3 million dollars, making it an expensive asset. To reduce costs while improving stormwater quality, many LGAs use community education programs, actively restore riparian vegetation, and/or have requirements for developers to implement appropriate stormwater design in their developments to reduce impacts.

Wetlands are another data-deficient area, with very little condition data and little accurate mapping of wetland extent. Assessment of 14 wetlands in the CMA Region indicates wetland condition is poor across any wetland outside of national parks, with high pressures from land-use practices, pests, and alteration. Comprehensive mapping of wetland extent and condition is required across the CMA Region. Restoration work on wetlands involves weed removal and planting of appropriate species, and is achieved generally with grant funding and volunteer assistance. Approximately 5,000 hectares of wetlands were remediated in the CMA Region in 2011–12.

Groundwater sources are under pressure in some parts of the CMA Region, with one groundwater source (Alstonville Basalt) over-allocated and in the high risk category, and Stuarts Point with 92% of its water allocated, placing it at moderate risk of overuse. The remaining sources are considered at low risk of over allocation, however, better information will be available once metering of groundwater is established. Water sharing plans (WSP) are proposed for the entire region, however, only four have commenced to date covering only 2% of the region. The four existing WSPs cover nearly 90% of the groundwater dependent ecosystems (GDE) in the area, with an additional 1% of GDEs located within the national park estate.

Marine water quality is generally good at ocean swimming beaches within the region as assessed under the Beachwatch partnership program. Monitoring of chlorophyll-a levels, an indicator of algal blooms, was conducted at five locations along the coast. The results indicate the region has a higher number of days where the levels exceed the guideline compared to the rest of NSW, with Yamba and Laurieton having the highest readings. High chlorophyll-a levels at Yamba are due to proximity to the Clarence River discharge, while Laurieton has natural upwellings that contribute to the high levels.

Much information has been gathered recently on rocky reef biota in the CMA Region. Comprehensive seabed mapping has covered 30% of the marine waters of the region, identifying areas of complex reef likely to support high levels of biodiversity. Surveys of fish assemblages reveal a mix of temperate, tropical and subtropical species reflecting the mix of different ocean currents in the region. Marine communities vary greatly from the inshore to offshore, with inshore areas having more temperate, cool water species, and offshore areas having higher tropical and subtropical species, and more fish species overall. However, major differences in species diversity were found on reefs in close proximity to each other, indicating individual reef locations can support unique species assemblages.

Marine debris surveys have shown that urban locations are the most heavily impacted, with fishing-related debris being the biggest contributor. Ongoing monitoring of mollusc and fish species richness is occurring along the region's coast. This information has management implications as it indicates that the protection of species and habitats needs to be across the range of depths and distances offshore, and for a variety of reef types.

Marine protected areas (MPA) currently cover 38% of the CMA Region's waters (not including Lord Howe Island) with 6% of the Region's waters managed for complete protection, and 17% managed for low-impact recreational and commercial fishing activities.

Coastal zone management is developing in the CMA Region, with seven of the 10 coastal councils having completed coastal hazard mapping which identifies areas most prone to erosion and inundation. Four coastal councils have completed most or all of their coastal zone management plans. All councils in the region have commenced both the coastal hazard mapping and the development of their coastal zone management plans.

Photo 1: Soiltary Islands Marine Park.
Photo 1 by: Hamish Malcolm
Photo 2: Clarence Valley Council

Key issues and gaps identified

A number of key issues and data gaps were identified during the production of the report.

Key issues

Waste information: Waste data collected in each LGA is different, making it difficult to identify trends in waste by type and sector. Some waste contractors collect waste in one LGA and dispose of it in a neighbouring LGA making it difficult to accurately determine waste by LGA.

Clearing approvals: LGAs reported concerns about their lack of involvement in decision-making regarding private native forestry and biobanking programs as there are often local information sources and environment plans that are not considered when agreements are made at state level.

Land management: Some councils expressed a desire to know more about land use within their area. Councils have knowledge of land and property use within urban areas, but not in rural areas, making it difficult to know whether a change in land use may impact positively or negatively on the surrounding environment.

State-level data: Many councils reported concerns about the lack of communication between state and local government regarding natural resource monitoring, access to information, and notification of when monitoring work was undertaken.

Bore construction: Some councils reported inappropriate bore placement, with instances of bores being sunk through septic absorption trenches and through water intake pipes. Better communication between the NSW Office of Water and local government is encouraged to ensure bore site selection and construction are appropriate.

Onsite sewage management systems (OSMS), can have a high failure rate and have been responsible for closures of oyster growing areas in the region's rivers. Increased resourcing to enable better mapping and risk assessment of OSMS is required by all councils in the reporting region.

Reporting duplication: Councils report to the Environment Protection Agency (EPA) and the Office of Environment and Heritage (OEH) on WWTP licensing and waste but at different time periods to all their other reporting requirements. Landcare groups report to multiple agencies but in different formats and not with the information required for SoE reporting. The Office of Water (NOW) has better aligned reporting by undertaking financial year reporting on all water activities which is aligned with the local government's Integrated Planning and Reporting (IP&R) framework. It is hoped that better alignment of reporting can be achieved by the next SoE report in 2016.

Grant funding: This is an essential part of most remediation programs.

Volunteers and landholders: Volunteers are integral to restoration works on public land in the CMA Region. The number of volunteer hours recorded is an underestimate but still equates to approximately 20 full-time employees each year. The contribution to restoration by private landholders is substantial and continued investment is necessary to maintain this.

Key data gaps

Energy consumption data: With the increased number of different electricity providers, it is becoming more difficult to get accurate energy consumption information for a region.

Vertebrate pests: There is a lack of local data on distribution and abundance of vertebrate pests, and scarce information on the success of control programs.

Water quality: There is a lack of comprehensive data across the CMA Region. All councils have expressed a desire to be part of the CMA-run Ecohealth program which comprehensively assesses riverine health. However, the current program will not be able to cover all LGAs within the CMA Region before the next SoE report in 2016. There is a need for a simple, cost effective water quality monitoring program that can be implemented by councils outside of the comprehensive Ecohealth assessment. It may be that existing monitoring for waste water treatment systems can be expanded to include additional parameters. Additional resourcing is required as many LGAs do not have laboratory facilities for sample analysis.

Riparian vegetation condition: There is a lack of local-level riparian vegetation condition information across the region, although some LGAs are conducting their own assessments. As degradation of native riparian vegetation is listed as a key threatening process for aquatic species, improved data is essential.

Wetlands condition: There is a lack of information on wetland extent, type and condition throughout the CMA Region. Wetlands mapping to date has been inaccurate and although classified by type, does not give a condition assessment. A state-wide assessment of 14 key wetlands in the region indicates most are in a poor condition, and further identification and assessment of all wetlands is required.

Groundwater: There is little information on groundwater quality or accurate extraction data in the reporting region. The Office of Water is in the process of introducing metering to better assess extraction, and is developing assessment of groundwater quality.

Opportunities arising and future directions

Collaboration: This project has successfully brought together a range of state government agencies and local government areas, along with their expertise and data, in a collaboration to produce a comprehensive SoE report for the region that includes both regional- and state-level data alongside local government information. The involvement by all project partners has been commendable and the provision of data has been efficient in most respects.

Reporting alignment: This project will be used to develop a model to improve the alignment of State SoE and State of Catchments (SoC) reporting, catchment action plans (CAP), the NSW monitoring, evaluation and reporting (MER) Strategy and local government reporting, and is identified in the draft Northern Rivers CAP 2013–23 as a reporting tool.

Reporting efficiency: Data collation and reporting for a group of councils is more time efficient than reporting for individual councils and reduces the number of data requests to state agencies.

Reporting coverage: The Regional SoE report includes information on natural resource management (NRM) in areas outside of LGA control, which are not generally reported on by council. This results in a broader SoE report.

> The compilation of this Regional SoE Report for 2012 has highlighted the vast quantity of high-quality environmental information gathered by both state and local governments in the region.

However, many areas require further action to establish better baseline information on environmental condition, and to enhance agency and council responses. It is hoped that the Regional SoE Report collaboration will continue to evolve and develop to allow another RSoE report in 2016.

Photo below: Catherderal Rock Flower, NSW
Photo by: Nigel Blake

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