SOE 2012

COFFS HARBOUR CITY COUNCIL SUPPLEMENT

Photo: S. Hessey

This is a summary of the Regional State of the Environment 2012 (SOE) for the Coffs Harbour City local government area (LGA). The Coffs Harbour LGA covers 117,280 hectares in the centre of the reporting region. It enjoys a diverse natural landscape of mountains and coastlines, with the Great Dividing Range at it's closest point to the coast, and a multitude of small rivers and creeks, wetlands, and a spectacular marine environment all within the traditional Country of the Gumbaynggirr people.

People & the Environment

Climate characteristics

The 2011-2012 reporting year was characterised by a wetter than average year with the cooler summer temperatures due the continuing influence of the La Niña cycle. Rainfall received in January and June 2012 was double the average, with Coramba and Woolgoolga receiving their highest January rainfall for 20 years in 2012 (Figure 1).

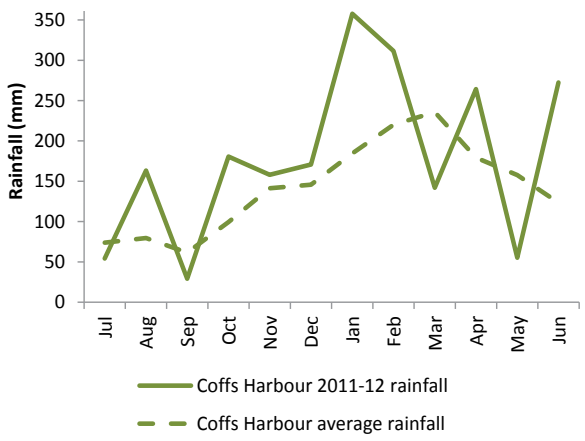
Population and densities

The 2011 census estimated the Coffs Harbour City population at 70,933, up by 4.4% from the 2006 population of 67,932. This was just below the NSW state average of 5.6% increase since 2006. It was the third highest growth area in the reporting region after Tweed and Port Macquarie-Hastings LGAs. Growth in the LGA since 2001 is 11.1%, well above the NSW average of 8.8%. Population density for the reporting region in 2012 was 58 people per square kilometre.

Greenhouse gases

Atmospheric carbon dioxide in 2012 was 388.8 parts per million, with national greenhouse gas emissions at 546.8 mega-

Figure 1: Rainfall for 2011-12 and average rainfall for Coffs Harbour



tonnes carbon dioxide equivalent (CO_2-e). Locally, in 2011-12 Coffs Harbour LGA residents consumed a total of 495 gigawatt hours of electricity, or 6,984 kilowatt hours per person, emitting 6.3 tonnes CO_2-e per person for the year, below the regional average of 7.6 tonnes CO_2-e per person.

Council use of electricity and fuel for 2011-12 produced total emissions of 19,412 tonnes CO_2-e or 0.27 tonnes CO_2-e per person (table 1).

Table 1: Electricity, streetlighting and fuel consumption for 2010-2012, including per capita emissions

Item	2010-11	2011-12	2 year trend	Tonnes CO_2-e	Per capita emissions (tonnes CO_2-e)
Electricity (gigajoules)	-	60,173.0	-	15,043	0.21
Streetlighting (gigajoules)	-	7,223.1	-	1,806	0.03
Fuel (kilolitres)	928.6	987.3	increase (6%)	2,563	0.04

Coffs Harbour City LGA residents contribute 5.9 gigawatt hours of renewable energy to the grid (the fifth highest in the reporting region), which equals 82.5 kilowatt hours per person and abates 0.07 tonnes CO_2-e per person. Council is contributing to greenhouse gas abatement through a large solar power installation on Rigby House, administration building retrofit, and a bicycle fleet for short trips.

Surface water extraction

Water usage overall showed a slight increase (9%) from 2010-11 to 2011-12 from 236 kilolitres per connection in 2010-11 to 260 kilolitres per connection in 2011-12.

Waste

Overall waste has decreased by 2% since 2010, with waste to landfill decreasing by 5%, and waste recycled or diverted from landfill increasing by 4%. Coffs Harbour LGA has the fifth highest level of waste generation in the reporting region at 1,055.8 kg per person in 2011-12. Waste from both domestic and commercial sectors has reduced over the two-year period, with an increase in recycled waste (figure 2). The composting of green waste has diverted 23,177 tonnes waste from landfill. In 2012, each person sent 436.9 kilograms of waste to landfill (below the reporting region average of 624.4 kg) and recycled 618.9 kg (above the reporting region average of 521 kg).

Biodiversity and Vegetation

Resilient landscapes

Coffs Harbour City Council has 10 local plans which manage biodiversity, including the Coffs Harbour Biodiversity Action Strategy, biodiversity monitoring plan, Koala Plan of Management (Northern Precinct), Vertebrate Pest Management Plan, Ecohealth monitoring program, Jaliigirr project, Class 5 vegetation mapping project, Corridors footprint landscape linkages, vegetation management plan, and biodiversity guideline development.

An analysis of habitat showed that overall, Coffs Harbour LGA has 68.7% of native vegetation remaining intact, the sixth highest in the reporting region. The LGA has a high effective habitat area (higher than the regional average), and although this was mostly confined to existing national parks and state forests, there was a substantial area of private land with good habitat connectivity. Vegetation change or loss in the LGA is the highest in the reporting region, with 4.8% (5,613 hectares) of vegetation removed or altered since 1988, primarily due to forestry harvesting activities on both public and private land (figure 3).

Coffs Harbour LGA has 12.4% of its area covered by national parks and reserves, with an additional 8,520 hectares (7.3%) under environmental zoning in the Council's current local environment plan (LEP). A new LEP is in the final stages of preparation.

Figure 2: Waste for Coffs Harbour LGA for 2010-11 and 2011-12

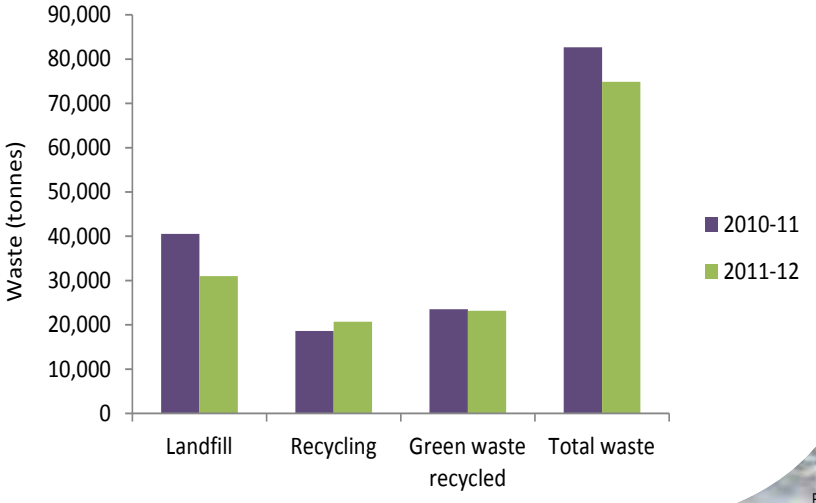



Photo: N Cotsell

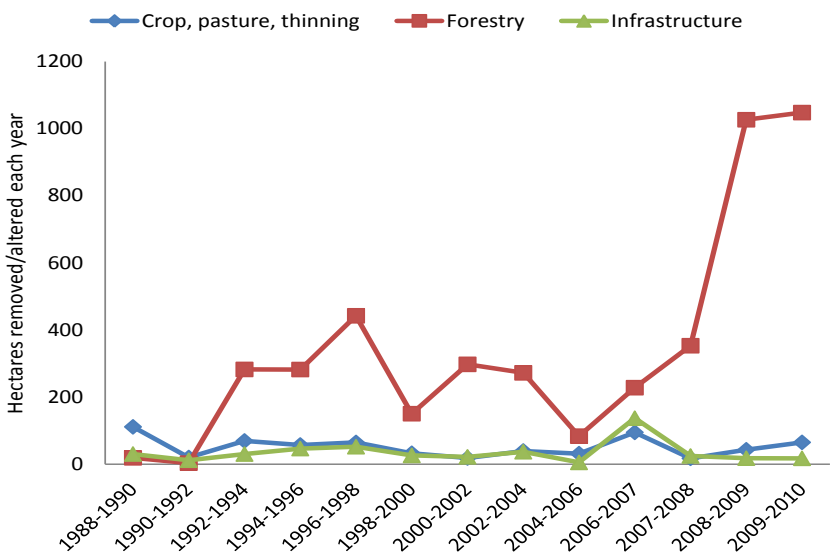


Figure 3: Woody vegetation change for Coffs Harbour LGA between 1988 and 2010

Over 178 hectares of land was restored during 2011-12, with a high input from volunteers and landholders.

Native flora and fauna

There are currently 107 species of flora and 159 fauna species listed as vulnerable or endangered in the LGA, with 13 endangered ecological communities and 1 endangered fauna population (emu). The reporting region has a total of 448 threatened species. Key threatening processes (KTP) impacting flora and fauna species and communities include habitat loss, invasive species (flora and fauna), introduced disease, debris, and climate change. Thirty five of the 36 NSW KTPs are listed for the LGA, and 6 of the 7 aquatic KTPs, including degradation of riparian vegetation, and instream structures that alter natural flow regimes of rivers and streams.

Invasive species

Weed control for 2011-12 included treatment of over 440 hectares of high risk sites (properties or locations identified as having a high risk of weeds), and evidence of reduced impacts after treatment were apparent across 112 hectares. Vertebrate pests recorded in the LGA include cane toads, foxes, deer, wild horses, feral cats, and the Indian myna. Council implements programs for threatened species threat abatement (such as protection of little terns from foxes and dogs at Hearnes Lake), conducts urban fox trapping, implements its vertebrate pest management strategy, has a wild horse program, and has educational and sighting programs for cane toads.

Land use and soils

Three key soil types occur in the Coffs Harbour LGA. Soil condition and management techniques are in table 2.

Table 2: Soil types and management for Coffs Harbour LGA

Soil management unit	Condition and comments
Clarence Sodic Soils	Fair condition generally with specific issues for gully erosion (poor), and organic carbon, sheet erosion and acidity (fair). Maximising ground cover, retaining stubble, practising minimum tillage, and managing acidity through reducing cropping intensity, reducing nitrogen fertiliser use and increasing lime will assist with reducing further decline.
North Coast Acid Sulfate Soils (ASS)	Good condition generally with specific issues for acidity (poor) and management of organic carbon required to prevent decline. Prevention of exposure of buried ASS is the key to managing these soils.
North Coast Floodplains	Good to very good condition for all indicators except organic carbon, which is very poor. This means soil has been degraded due to intensive conventional cropping over a long time. Minimum tillage and maximising ground cover (retaining crop stubble) will improve organic carbon levels.

Acid sulfate soils (ASS) are a particular issue along the NSW coast as when disturbed, these naturally-occurring soils release acidic compounds into adjacent waterways impacting aquatic life and water quality. ASS are only an issue when disturbed, usually by agriculture or development. Coffs Harbour City Council has not conducted any specific remediation of ASS in the LGA, but has provisions within its Local Environment Plan restricting activities on identified ASS.

Water

Freshwater and estuarine rivers

Coffs Harbour CIty Council conducted comprehensive water quality monitoring in 2011 through the CMA-led Ecohealth program (for more details please refer to the Ecohealth report card on Council's website). Overall water quality was fair to poor, with freshwater rivers being rated as better than estuaries. Key issues were nitrogen levels exceeding the guidelines in over 50% of samples in the majority of river systems, and some lagoons exceeding the guidelines on all samples. Phosphorous levels were an issue for Moonee Creek, where further investigations are recommended. Chlorophyll-a was an issue for Darkum Creek and Hearnes Lake, both having the poorest water quality overall. Faecal coliform concentrations were highest after rainfall, and were particularly high in Woolgoolga and Arrawarra creeks, too high to allow swimming or any direct contact, and were also above the recommended limits for safe swimming in Coffs, Moonee and Darkum creeks. Poorest water quality was found at the tidal limit of each system, where contaminants appear to be deposited. Dissolved oxygen (required to maintain aquatic life) was below the guideline at the majority of sites during low river flow and warmer temperatures. The Corindi River system had the best water quality of all the LGAs river systems. The extremely high rainfall received during the year contributed to poorer water quality, and further assessment of water quality during drier conditions is recommended.

NSW monitoring of estuary water quality during 2009-10 showed a range of results. Station Creek had 'very good' water quality, meaning over 90% of samples were within the water quality guidelines for chlorophyll-a, a key measure used to determine water quality. Corindi River, Woolgoolga Lake, Pipe Clay, Moonee and Pine Brush creeks rated as 'good', meaning over 50% of samples passed the guidelines; Hearnes Lake, Boambee and Bonville creeks rated as 'fair' (30% of samples passed the guidelines); and Arrawarra and Coffs creeks both rated as 'poor' (0% of samples passed the guidelines). Darkum Creek was not assessed for this program.

Macroinvertebrates (water bugs) are an indicator of river health as certain types of water bugs are pollution tolerant and others very sensitive, so the type of waterbugs in a stream reflects its water quality. Ecohealth results indicate moderate to severely impacted systems, with the species found being typical of polluted and disturbed systems. NSW monitoring for the LGA in years prior to 2011 shows 28% of samples scored an 'A' for good condition, 42% showed significantly impaired condition, 28% showed severe impairment and 2% extreme impairment.

Fish condition was assessed as part of NSW-wide monitoring, and showed Coffs Harbour LGA has 'poor' to 'very poor' condition, meaning that there were fewer species found than expected, and there were very few young. The coastal plain scored better than the lowlands and slopes, having more species, however the upland or alpine regions in the west of the LGA scored very poorly, with few species present and very few young.

Riparian vegetation extent is another measure of river and estuary health due to its functions to prevent nutrients and pollutants entering waterways. Ecohealth results indicate riparian vegetation is in fair condition generally, but is in good condition at Arrawarra Creek and Corindi


Photo: J Turbill

River, and poorest condition in Boambee Creek. Most riparian vegetation was dominated by weeds such as camphor laurel and *Lantana camara*. However, bank condition scores were excellent, highlighting the importance of riparian vegetation (whether native or exotic) in minimising erosion during high rainfall years. NSW monitoring indicates 66-74% of riparian vegetation is disturbed in the Woolgoolga Lake, and Coffs and Pine Brush Creeks. However highly protected areas such as Station Creek has 0% disturbance, the best in the reporting region. In 2011-12, 100 hectares of riparian vegetation was restored in the LGA with 2,700 trees planted and 1,750 volunteer hours contributed.

Waste water treatment plant (WWTP) operation, on-site sewage management systems (OSMS - such as septics), and stormwater management are key pressures impacting river and estuarine health. Coffs Harbour City Council operates 5 WWTPs which reused 1,882 megalitres (21.5%) of tertiary treated wastewater, releasing the remaining 6,879 megalitres (78.5%) to waterways.

OSMS performance is an issue for all LGAs in the reporting region. OSMS can impact water quality through being located too close to streams and creeks, allowing effluent to enter the watercourses when not functioning adequately, and may also impact groundwater if bores are placed too close to OSMS absorption trenches. In Coffs Harbour LGA, of 5,392 registered systems, 910 were inspected in 2011-12, 350 of these failed (38%), and there are an unknown number of unregistered or unapproved OSMS in the LGA.

Stormwater management in the LGA is governed by the Coffs Harbour City Council Water Sensitive urban Design (WSUD) policy, which is being reviewed currently. Council maintains a series of gross pollutant traps to minimise debris entering stormwater, costing $12,000 per annum to maintain.

Wetlands

There is little information on wetland condition within the Coffs Harbour LGA or in the CMA Region. Council has recently completed its comprehensive Class 5 vegetation mapping, which has mapped wetlands and provided some information on condition. Coffs Harbour City Council carried out restoration work on 128 hectares of wetlands within the LGA in 2011-12, planting nearly 7,000 trees.

Groundwater

Groundwater in the LGA is managed by the NSW Office of Water. There are seven groundwater sources which overlap the Coffs Harbour LGA. All groundwater sources are within the calculated annual extraction limit and are considered to be at low risk of over allocation (table 3). No water sharing plans are currently in place for these groundwater systems. There are no identified groundwater dependent ecosystems (GDEs) within the LGA.

Photo: N Cotsell

Table 3: Groundwater sources, allocations and status for the Coffs Harbour LGA

Water source	Rainfall recharge (ML)	Annual extraction limit (ML/yr)	Total requirements ML/yr	Risk Category^	% allocated	Groundwater sharing plan status
Clarence and Coffs Harbour Alluvium	149,459	0	4,695	1	no limit set	Proposed
Clarence Coastal Sands	77,042	24,317	45	1	0.2	Proposed
Clarence Moreton Basin — Clarence River	357,065	270,496	,517	1	0.6	Proposed
Clarence River Fractured Rock	20,456	13,060	320	1	2.5	Proposed
Coffs Harbour Coastal Sands	20,294	5,825	123	1	2.1	Proposed
Coffs Harbour Metasediments	400,660	206,731	1,433	1	0.7	Proposed
New England Fold Belt Coast — Clarence River	427,987	221,552	364	1	0.2	Proposed

^ Risk categories: 1=low, 2=moderate, 3=high

Near-shore marine

Coffs Harbour City has a highly-valued marine environment, with the southern half of the Solitary Islands Marine Park and the adjacent Commonwealth Solitary Islands Marine Reserve stretching from Station Creek down to Muttonbird Island at Coffs Harbour.

Sections of the coastal seabed of the LGA have been mapped within the Solitary Islands Marine Park. Extensive shallow and intermediate reef occurs throughout the waters off Coffs Harbour LGA, many with complex features such as gutters and ridges, providing habitat for the large variety of tropical, subtropical and temperate marine species that have been documented within the marine park.

A linear section of deep reef (60-70 metres deep) was identified offshore from Station Creek and offshore from Split Solitary Island, which may indicate an ancient coastline.

Studies conducted within the Marine Park have shown that the local marine environment contains a high species diversity due to the convergences of warm northern currents, such as the East Australian Current (EAC) and cooler southern currents, and the complex reef formations present including the Solitary Islands themselves. Locally, over 90 species of corals, 150 species of algae (seaweed) and 530 species of reef fish have been identified.

The coastal zone of Coffs Harbour LGA has been mapped for erosion and inundation risk, and a coastal zone management plan is in preparation as per the requirements of the *Coastal Protection Act 1979*.

This supplement is part of the Regional State of the Environment 2012
For full details, data sources and references please see
http://www.northern.cma.nsw.gov.au/projects/regional-soe.html

Coffs Harbour City Council