BEGA VALLEY SHIRE COUNCIL

State of the Environment Report 2011/2012

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Introduction

The State of Environment (SoE) report provides a 'snapshot' of the current natural and built environment and identifies key issues and trends for the Bega Valley Shire. The report assesses Council's progress towards achieving the community's environmental objectives set out in the Community Strategic Plan (CSP) (2011).

The 2011/12 Bega Valley Shire Council (BVSC) SoE report is divided into themes required by legislation and uses the driving forces and environmental indicators outlined by the Australian Capital Regional (ACR) Group of Councils in 2009, of which BVSC is a part. This provides consistency in data collection and reporting within the council group and facilitates future regional group SoE reporting.

This SoE report is focussed on the 2011/2012 period. Under the previous reporting framework, a comprehensive SoE was required in 2012. However, with the new reporting framework introduced by the NSW Government in 2010, the four (4) year comprehensive SoE reports and annual supplementary SoE reports are no longer required. Instead one SoE is required every four (4) years in the year of the ordinary election and is required to report against the environmental objectives outlined in the CSP. The BVSC CSP was adopted in 2011 and therefore this report is focused on the 2011/12 period. However, where appropriate, the report also considers data and Council initiatives dating back to the last comprehensive SoE report in 2004-09. This will provide trending analysis in order to better assess performance. The next SoE will be due in November 2016.

Our Shire

The Bega Valley Shire is located at the south-eastern extremity of New South Wales approximately half way between Sydney and Melbourne. At 6,279 square kilometres the Shire is the largest coastal Council in the State.

Despite the size of our Shire our population is relatively small and dispersed amongst several population centres. Only 25% of our Shire's area is rateable. The remaining 75% comprises of National Park and State Forest.

The Bega Valley Shire is renowned for its dairy industry, timber and fishing heritage. Unspoilt natural beauty and a valued 'clean and green' image make it a prime holiday destination for both domestic and international tourists.

The natural features of the Bega Valley Shire:

- 225 km of coastline (longest in NSW)
- 101 ocean beaches
- 29 estuaries
- 400 km of estuarine foreshore
- 121 SEPP wetlands, with a combined area of 2753 hectares
- 75% of the Shire is National Park, State Forest or Crown reserves.
- 25% of the Shire is rural residential & agriculture.

Previous Reports

The first formal assessment and reporting of environmental quality in the Shire occurred in 1994. State of Environment (SoE) reports have been completed annually, in accordance with the Local Government Act 1993.

In 1997 Council resolved to approach SoE reporting on a regional basis and the required comprehensive report was completed in conjunction with the ACR. The 2000, 2004, 2008 and 2009 SoE Reports continued this process and will be used as Council's baseline for reporting into the future. In addition, Council provided annual Supplementary SoE reports in 2009/10 and 2010/11 independent of the regional group.

Under the new NSW Integrated Planning and Reporting Framework, Section 428 of the Local Government Act 1993, requires that a SoE report be provided once every four years as part of the Annual Report in the year of an ordinary election.

All reports since 2000 are available on Council's website.
www.begavalley.nsw.gov.au/Environment/Environment_Reports/Environment_Reports.htm

Regional Reporting Framework

This report uses the *Sustainability Steps framework* introduced in the previous Regional comprehensive SoER 2009 for local councils in the Australian Capital Region (ACR) (Office of the Commissioner, 2009). This framework addresses new requirements under the NSW *Local Government Amendment (Planning and Reporting) Act 2009* and provides councils with increased flexibility compared to the previous more prescriptive system.

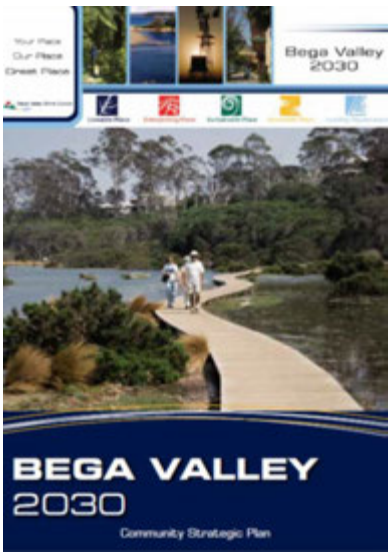
It specifies six themes, three driving forces and 32 specific environmental indicators. Driving forces, such as population growth, land-use change, and climate variability, influence overall levels of production and consumption, which in turn exert pressures on the environment. The indicators variously address environmental condition (or state), key pressures, and responses in the same way as all previous reports have.

Figure 1: Local Government Planning and Reporting Framework

Community Strategic Plan

The NSW Government introduced a new model of reporting called the Integrated Planning and Reporting Framework for local Council in 2010. Its aim is to ensure councils are taking a strategic long term approach to their activities and that these reflect the desires of the communities they represent. In order to ensure this occurs the Integrated Planning Model advocates a 'three tier' hierarchy of plans consisting of a Community Strategic Plan (20 year), a Delivery Program (4 year) and an Operational Plan (1 year) (Figure 1).

The Plan



Council Banner
Your Place Our Place Great Place

Vision
The Bega Valley is a community that works together achieving a balance between quality of life, enterprising business, sustainable development and conservation of the environment.

Framework to achieve the Vision
Bega Valley 2030 has five key themes. These reflect the ambitions of the community and the Council's role. The themes are presented in a manner that outlines the outcomes that are to be achieved by 2030. The themes and related ambition statements are:

A LIVEABLE PLACE
To support a place where everyone regardless of age of circumstance can enjoy a safe, involved and affordable community life.

AN ENTERPRISING PLACE
To support a creative and innovative business community invigorating growth in employment and economic activity, in partnerships with government.

A SUSTAINABLE PLACE
To ensure the unique environment is protected to maintain biodiversity and water quality and managed for our community, to provide growth and economic opportunity.

AN ACCESSIBLE PLACE
To plan, and provide a comprehensive mix of public and private sector services and facilities in order that residents and visitors have access to the quality health, recreation, education, employment, transport, utility and retail resources they want and need.

A LEADING ORGANISATION
To shape an organisation that supports the agreed aspirations of the community within the capacity of the community and the capability of the organisation.

The 2011/12 SoE reports on Council's progress in the first year of implementing the Community Strategic Plan (CSP) towards achieving its twenty (20) year environmental outcomes. Consequently, there has not been the time passed for the SoE to assess Council's performance in achieving the objectives against the CSP key performance areas. Therefore, this report discusses Council's actions in one (1) year as a performance assessment instead of using an analytical scoring system. A more structured approach for evaluating performance may be adopted for future SoE reporting.

The 20 year strategic outcomes and review of Council's achievements towards progressing these in 2011/12 are displayed in Table 1. The SoE recommendations are also presented in Table 1. The recommendations provided in this report should be used to inform revision of the Delivery Plan (4 year) and Operational Plan (1 year).

Of the 5 Strategic Priorities identified in Council's CSP, 'A Sustainable Place' and parts of 'An Accessible Place' pertain to the community's long-term environmental objectives. The key directions identified under the Sustainable Place and Accessible Place Strategic Priorities include:

A Sustainable Place:

S1 has **natural areas** including our catchments, waterways, coast, and bushland that are **protected** and enhanced.

S2 manages **development** to minimise impact on the natural environment.

S3 is a community that **lives** in a clean and **environmentally sustainable** way.

S4 has **towns and villages** are visually unique, centred around a variety of green spaces, lake, water bodies and natural areas.

S5 commits to total **water** cycle management practices.

S6 plans for and takes action to minimise the impact of **climate change** and other natural events.

S7 maintains and improves **health** of natural systems (soil, water, weeds) that support **agriculture**.
An Accessible Place: A8 towns and main villages has access to **potable water supply**. A9 the **sewerage** system meets the needs of both the permanent residents and holiday population. A10 **waste facilities** meet the public health needs of the community and business. A11 **energy** infrastructure meets the needs of business, the community and services. A12 **emergency funding and resource support** is earmarked and/or made available.

CSP Performance Review and Recommendations

Table 1 outlines the community environmental outcomes identified in the Bega Valley Shire Council's Community Strategic Plan (CSP) 2011 and where they are addressed within the 2011/12 SoE. In addition, Council's achievements towards meeting the 20 year outcomes in the first year of its implementation are reviewed in

Table 1 and recommendations born out of this report are provided.

Table 1: Review of Council's performance in progressing the Community Strategic Plan (2011) environmental outcomes in 2011/12 and recommendations.

Council's Achievements towards CSP Objectives (20 year)	Recommendations
CSP Strategic Priority: A SUSTAINABLE PLACE	
CSP Key Direction: S1: Natural environment protected	**Addressed in SoE: 1 – Water Management & 5 - Biodiversity management**
S1.1 Threatened communities, flora and fauna species are protected and enhanced through the provision of buffers, landscape scale corridors and recovery actions	
• Natural Resource Management partnership with Southern Rivers Catchment Management Authority formalised and in place. • Council's Estuary Health Monitoring Program was undertaken for 6 estuaries. Funding has been secured to continue program in 2012/13 and expand to 10 estuaries. • Protection of riparian habitats enhanced through expansion of buffers along waterways and consent criteria outlined in Clause 6.3 – Riparian land and Waterways, introduced into the Comprehensive Local Environment Plan (CLEP) 2012. • Protection of landscape scale corridor values enhanced through development and inclusion of new biodiversity layers in the CLEP 2012. • Council is assisting NSW OEH to review the NSW Threatened Species Program to refine and improve Priority Actions Statements (PAS) which list the actions required manage threatened species, ecological communities and key threatening processes in NSW. The PAS Review Report will be released in late 2012 or early 2013. The results of this review will be incorporated into Council's Biodiversity Strategy planned for development in 2013. • A management plan for the threatened Merimbula Star-hair has been commissioned and will be implemented in the next reporting period. • A Review of Environmental Factors (REF) was completed to undertake ecological burn trials to reinstate natural processes within the Bemboka Reserve. • Ten environmental and noxious weeds flyers developed and distributed; signage about garden escapes erected in four coastal villages. • Revised weed and vegetation management program implemented.	1. Include estuary health management as a strategic action in Council's Delivery Plan. 2. Continue to support community biodiversity conservation and monitoring programs, namely the Atlas of life on the Wilderness Coast and the Far South Coast Birdwatches group. 3. Encourage linking of biodiversity databases and information across government agencies. 4. Work closely with Southern Rivers Catchment Management Authority (SRCMA) to implement projects funded by the Clean Energy Futures grant. 5. Continue to consider biodiversity impacts in assessment of development applications and Council activities in accordance with legislation. 6. Incorporate best practice for biodiversity planning as outlined in the *Biodiversity Planning Guidelines for Local Government* (Commonwealth of Australia, 2006). 7. Education of staff and community on biodiversity values. 8. Implement appropriate monitoring programs to measure the effectiveness of Council's policies, strategies and activities in protecting and enhancing biodiversity. 9. Develop regional strategy for pest and weed management with government agencies, community and landholders. 10. Maintain collaborative arrangements with other land management agencies to ensure ongoing effectiveness with pest animal and plant control; fire management; and to develop awareness of new land management principles, innovations or approaches.
CSP Key Direction: S1: Natural environment protected	**Addressed in SoE: 1 – Water Management & 5 - Biodiversity management**
S1.2 The coastal zone remains our premier natural asset and is protected through appropriate land use planning, infrastructure siting and regulated	

Council's Achievements towards CSP Objectives (20 year)	Recommendations
CSP Strategic Priority: A SUSTAINABLE PLACE	
resource usage.	
• Increased buffers & appropriate zoning around estuaries to reduce risk from costal hazards introduced into CLEP 2012. • Tender documents for the continuing development for the Coastal Zone Management and Hazard Plan have been prepared and will be progressed in 2012/13.	11. Include air quality management as a strategic action in Council's Delivery Plan. 12. Implement a local and regional approach to air quality management and prepare a local air quality management plan that includes working with local businesses and industry to implement best practice air quality management strategies. 13. Implement "Control of Open Burning Policy" and administrative processes to support listing under Schedule 8 of Protection of the Environment Operations (Clean Air) Regulation 2010. 14. Council staff undertakes acoustic noise and assessment training.
CSP Key Direction: S1: Natural environment protected	**Addressed in SoE: 1 – Water Management & 5 - Biodiversity management**
S1.3 Our environmental qualities provide the Shire with a "natural advantage" over other coastal destinations and reinforce the "Wilderness Coast" brand.	
• A Community Environmental Improvement program for incorporated not-for-profit groups to undertake environmental improvement and rehabilitation projects was implemented.	15. Continue to reinforce the value of our coastal zone to the local tourism industry.
CSP Key Direction: S2: Manage Development	**Addressed in SoE: Driving forces**
S2.1 Certainty for siting of development by means of identified environmental constraints such as flood and bushfire risk	
• Developed and implemented flood and fire overlays for use in the Comprehensive Local Environment Plan (CLEP) 2012. • Updated bushfire hazard mapping has been submitted to Rural Fire Service for final approval which will enable the implementation phase to start.	16. Complete Bega River flood study.
CSP Key Direction: S2: Manage Development	**Addressed in SoE: Driving forces**
S2.2 Lands having key natural or cultural heritage values set aside.	
• European Heritage assessment criteria in CDCP and aboriginal study and protocols ensuring that cultural heritage management reflects legislative requirements as well as community expectations and values is underway • High value natural assets were given environmental zoning in CLEP 2012.	17. Investigation into wildlife corridors should highlight areas of high natural values. 18. Validate Endangered Ecological Communities (EECs) mapping and identify high value EECs for potential protection.
CSP Key Direction: S2: Manage Development	**Addressed in SoE: Driving forces**
S2.3 Planning controls reflects environmental values and minimise cumulative impact from development.	
• The Comprehensive Local Environment Plan (CLEP) was completed and submitted for gazettal. • The Council Development Control Plan (CDCP) review is ongoing.	19. Review Council's Sewage Management Strategy following changes to NSW DLG guidelines to ensure consistent approach across State. 20. Continue to maintain and prioritise inspections in un-sewered areas with high risk to the environment and public health and review inspection frequency requirements based on; system type, buffer distances and the system's over-all performance. 21. Prioritise watercourses for water monitoring and sampling based on sensitivity to on-site wastewater management systems (OSMs). Include watercourses used for food production (such as oyster leases) and where previous contamination issues have occurred. 22. Develop and support existing education programs to ensure that landowners and occupiers are well informed as to appropriate strategies to ensure the safe and effective operation of their OSMs.
CSP Key Direction: S2: Manage Development	**Addressed in SoE: Driving forces**
S2.4 Our "natural advantage" continues to provide economic opportunity for the attraction of new enterprise and industry that wish to take advantage of and capitalise on the Shire's natural values.	
• Bega River Estuary Management Plan drafted and due to be reported in 2012-13 to Council • REF's for all applicable infrastructure projects, ensuring decisions do not	23. Train Council staff in developing Review of Environmental Factors (REFs).

Council's Achievements towards CSP Objectives (20 year)	Recommendations
CSP Strategic Priority: A SUSTAINABLE PLACE	
impact upon our "Natural Advantage" are being prepared	
CSP Key Direction: S3: Living sustainably	**Addressed in SoE: 1 – Water management & 2 – Resources consumption**
S3.1 Draw on natural resources per capita (water, land, energy and fuel) is managed for reduction by Council.	
• The Corporate Sustainability Policy & Strategy was drafted for submission to Council. • The OEH Sustainability Advantage was implemented and the corporate 'footprint' was identified enabling future reporting to be conducted. • Water extraction for town supply decreased in 2011/12 (due to good rainfall, implementation of demand reduction measures & infrastructure upgrades). • Water Sharing Plans implemented, focusing Council's water supply management on reducing reliance on low stream flow. This will improve the environmental outcomes of surface and ground water management.	24. Consider changing SoE indicator from dam fullness to Individual Daily Extraction Limit (IDELS) for future reporting. 25. Develop, implement and appropriately resource an effective program of energy minimisation for Council operations. 26. Adopt Corporate Sustainability Policy and implement Strategy with the result of reducing Council's and the community's energy and water consumption.
CSP Key Direction: S3: Living sustainably	**Addressed in SoE: 2 – Resources consumption**
S3.2 Wastes generated per capita (domestic and construction waste and carbon emissions) reduced and waste sent to landfill minimised.	
• Waste to landfill decreased and waste diverted from landfill and into recycling increased in 2011/12. However, care must be taken when drawing assumptions from this data as it is based on estimates only and will not be exact until the new Central Waste Facility is built with a weighing station. • Council's carbon emissions increased in 2011/12 due to discontinuation of expensive green energy contract which offset Council's emissions for electricity consumption. However, this provided dedicated funding to improve Council's energy efficiency, decreasing energy costs and promoting more sustainable behaviour within Council & the community. • Waste resource recovery strategies such as tip shops, extension of kerbside recycling services, household chemical collection days and organic mulching have been successful in reducing waste sent to landfill. • An ongoing program of waste minimisation community education programs, with dedicated resource, was designed and is in place. • Established a service contract for mattress processing with Twofold Aboriginal Corporation, a social enterprise. Disassembling around 1000 mattresses per year to recover steel springs. • Won grant funding under the love food hate waste program to increase awareness of food waste and diversion via waste minimisation and home composting. • Provided in kind support for public events (collection and waste disposal services) including Cobargo folk festival, Eden Whale Festival, Bermagui game fishing festival etc. • Provided promotional and in-kind support (free tipping) for Clean up Australia Day, March 2012. • Councils waste management team is currently providing, through partnership with South Coast Producers Association (SCPA), support to community projects and initiatives such as farm gate sales and "locally grown" markets.	27. Continue to provide households hazardous chemical collections (HCC) 2 times annually in Bega, Bermagui and Eden. 28. Continue to expand community waste minimisation initiatives such as the Every Home a Farm program.
CSP Key Direction: S3: Living sustainably	**Not addressed in SoE**
S3.3 Community's reliance on cars for transport within and between urban centres is reduced.	
• Pedestrian and cycle plan was commissioned. Findings will inform future plans.	29. Complete and implement a cycle strategy.
CSP Key Direction: S3: Living sustainably	**Addressed in SoE: 1 – Water management & 2 – Resources consumption**
S3.4 Community based sustainability initiatives are supported and implemented across Shire.	
• Council partnered with numerous community and government groups in 2011/12 to improve the sustainability of water resources (refer Sections 1a & 1b). General outcomes included; reduced litter along coastlines	30. Develop waste minimisation education plan.

Council's Achievements towards CSP Objectives (20 year)	Recommendations
CSP Strategic Priority: A SUSTAINABLE PLACE	
and estuaries provided education to school children on stormwater cleanliness, enhanced riparian vegetation and reduced impacts to rivers from dairy cows. • Love our Lakes is a critical program for involving the community in caretaking our coastlines. • Employment of a Waste Minimisation Education Officer has facilitated greater engagement between Council and community groups on waste minimisation and reuse initiatives. Numerous projects were undertaken with community groups that saw recycled art, worm farm and permaculture workshops, clothes swaps and general waste minimisation education including reducing food to landfill.	
CSP Key Direction: S4: Towns and Villages	**Not addressed in SoE**
S4.1 The existing open space areas and landscape features of our towns and villages are retained and have expanded with population growth.	
• Desired character/outcomes for individual towns have been formally included in the CDCP. These are the focus of workshops being held in terms of signage for the towns, which will be progressed into 2012-13. • Development of policy, procedures and processes for new committee members and volunteers as well as training and support programs was agreed and initiated.	
CSP Key direction: S5: Total water cycle management	**Addressed in SoE: 1 – Water management**
S5.1 Maintain water quality in accord with Integrated Water Cycle Management Plan (IWCMP).	
• Water quality maintained in accordance with sewerage system licence requirements, water licences and Council procedures and plans. • Project aimed at construction of water treatment facilities in accordance with the adopted Asset Management Plan was launched and is in the data acquisition and design stage. • A flood plain management study & asset and condition data collection have both been commenced. • A Merimbula effluent study, considering how to increase beneficial effluent reuse is 90% complete with outcomes being evaluated in line with ongoing regulatory requirements. • Surface and groundwater monitoring programs continue to monitor short term and long term changes to water quality. Potential water quality issues associated with effluent reuse and disposal are managed through monitoring, on-site controls, operational procedures, research, investigations, education and awareness and planned STP and reuse/disposal system upgrades, coordinated by the Water and Sewerage Services section of Council, in partnership with effluent users and other stakeholders like the EPA. • Research is initiated where water quality issues require specialist analysis and understanding (eg. Merimbula Bay Algal Bloom Study).	31. Continue involvement with the NSW OEH (EPA) Beachwatch Program. 32. Develop a catchment education plan. 33. Investigate development of an Integrated Water Cycle Management Plan once the revised guidelines are issued by the NSW Office of Water and acceptance by BVSC.
CSP Key direction: S5: Total water cycle management	**Addressed in SoE: 1 – Water management**
S5.2 Effluent reuse across the Shire area maximised	
• All Council's 10 STP's are set up for effluent reuse. This may be on a nearby golf course, playing field, showground or farm. Demand for effluent reuse varies with seasons and weather and is greatest in summer and lowest in winter. This leads to variability in the volumes of effluent reused from a dry year to a wet year and requires winter storage infrastructure to increase reuse use. Effluent reuse is therefore maximised in terms of enabling access to effluent for irrigation when needed by the user. • New effluent reuse schemes are being investigated to further increase the volume of effluent reused, particularly for Merimbula STP.	34. Consider using indicators; effluent reuse volume and storage capacity in future SoE reporting.
CSP Key Direction: S6: Climate Change	**Addressed in SoE: 3 – Climate adaption & 2 – Resources consumption**
S6.1 Council plans integrate mitigation and adaptation measures in respect of climate change into operations and strategic planning.	

Council's Achievements towards CSP Objectives (20 year)	Recommendations
CSP Strategic Priority: A SUSTAINABLE PLACE	
• A Draft Climate Change Policy was developed and will be presented to Council in 2012/13. • A climate change risk management and adaption strategy has been initiated and is in drafting stage in anticipation of adoption of policy • Many risks identified in Council's Climate Change Risk Assessment (2010) have been incorporated into Council's CLEP 2012, Asset Management Plans and Asset Protection Zone (APZ) program.	35. Continue efforts in determining Council's carbon footprint and use this data to implement energy efficiency and renewable energy initiatives. 36. Implement actions from the Sustainability Advantage modules across Council assets to reduce Council's operation costs and carbon and other greenhouse gas emissions. 37. Seek adoption of regional sea-level rise triggers for adaptation responses. 38. Adopt Climate Change Policy and implement Climate Change Strategy. 39. The Climate Change Strategy should include an assessment of asset vulnerability, trigger based development consent based on coastal hazards, the economic life of Council assets and community resilience.
CSP Key Direction: S6: Climate Change	**Addressed in SoE: 3 – Climate adaption & 2 – Resources consumption**
S6.2 Community and business projects focussing on alternative energy are supported and implemented.	
• Council partnered with Essential Energy to trial an Intelligent Solar Energy system on the Bega Library in 2012. The system stores solar generated electricity which is released to the network during early evening demand. • Council continues to support the community group, Clean Energy for Eternity to install renewable energy systems on Rural Fire Service buildings and Community Halls.	40. Identify future community partnering opportunities for renewable energy projects.
CSP Key Direction: S7: Health of natural systems	**Addressed in SoE: 4 – Land resources**
S7.1 Healthy landscapes based on protection of natural resources, innovative land use policies and Government/community partnerships.	
• Natural resource management partnership with SRCMA formalised to bring a more integrated approach to the funding and management of natural resources within the Shire. • Revised weed and vegetation management program implemented, along with plan to phase in staff recruitment and ensure succession planning. • Council adopted an innovative approach to land use planning in the development of the CLEP 2012 using a "landscape approach" rather than adopting the "like for like" approach used in other Councils. This provided an integrated system of zonings that gives protection to estuaries, their immediate catchments and provided functional links to the adjoining areas of National Park and State Forest. This ensured that key natural and social values were protected and enhanced through application of appropriate Environmental Zonings, land use tables and Natural Resource overlays. • Numerous projects were undertaken to protect and enhance our natural resources in the reporting period that saw the partnering of government and community groups. These are discussed in Sections 1.9, 4.2 and 5.6 of this report. • Erosion and Sediment Control Policy and Guidelines based on the, "NSW Soils and Construction - Managing Urban Stormwater", Volume 1 & 2 (the Blue Book) (DECCW 2004 & 2008) were drafted and will be presented to Council in 2012/13.	41. Undertake an audit of all sites in the Shire either previously or currently used in the Shire for underground petroleum storage and liaise with EPA staff to ensure that obligations under the POEO UPSS Regulation 2008 are met. 42. Continue the implementation of the contaminated land management best practice requirements in the Contaminated Land Planning Guidelines - State Environment Planning Policy 55 "Remediation of Land".
CSP Key Direction: S7: Health of natural systems	**Addressed in SoE: 4 – 1 – Water management & 5 - Biodiversity management**
S7.2 Ecosystem services are valued by our community and are key considerations in planning for our rural areas.	
• Key biodiversity areas and waterways were utilised for land use planning in the CLEP 2012 in order to protect the services we receive from water, biodiversity and productive land. • Community education on ecosystem services was undertaken through the Love our Lakes, and Healthy Soils Healthy Farms programs, of which Council are a partner.	43. Work with SRCMA in delivery of new Catchment Action Plan (CAP) which focuses on landscape resilience and ecosystem services.
Council's Achievements towards CSP Objectives (20 year)	**Recommendations**
CSP Strategic Priority: AN ACCESSIBLE PLACE	

Council's Achievements towards CSP Objectives (20 year)	Recommendations
CSP Strategic Priority: AN ACCESSIBLE PLACE	
CSP Key Direction: A8: Water	**Addressed in SoE: 1 – Water management**
A8.1 Drinking water supplies provided in accordance with the levels of service detailed in the Water and Sewerage Services Strategic Business Plan.	
• Water management met all licence requirements in 2011/12. • Drinking water quality was excellent quality in 2011/12 with 100% of samples meting the Australian Drinking Water (ADW) Guidelines.	44. Include meeting IDEL requirements as a performance indicator in CSP.
CSP Key Direction: A9: Sewerage	**Addressed in SoE: 1.5 – Discharge to waters**
A9.1 Reticulated sewerage services provided in accordance with the levels of service detailed in the Water and Sewerage Services Strategic Business Plan.	
• Discharge of treated sewerage to receiving waters met licence requirements in 2011/12. • There were only 62 unauthorised surcharges or chokes which had negligible impact on the receiving environment and none triggering a report to the NSW OEH. • Swimming water and estuary health monitoring in 2011/12 showed excellent water quality with negligible impacts from sewerage discharge. Algal bloom studies in Merimbula Bay suggest a small impact from the Sewerage Treatment Plant (STP) in prolonging blooms, but that diffuse sources are also important to the growth of the algae. Monitoring programs have been effective is helping to assess and improve Council's management of these resources.	45. Continue to minimise overflows from the sewerage system especially during wet weather events and particularly close to sensitive or critical risk areas such as oyster producing estuaries. 46. Enforce liquid trade waste licence requirements and continue business education to minimise overflows from chokes.
CSP Key Direction: A10: Waste	**Addressed in SoE: 2.4 – Waste management**
A10.1 Manage waste in accordance with waste strategy and land fill management plans in a financially sustainable manner.	
• Received development consent and a scheduled development works licence for the Central Waste Facility. • Reconstructed Wanatta Lane in order to comply with Council's development consent conditions prior to lodging a construction certificate application for the Central Waste Facility. • Prepared numerous reports, designs and plans to comply with 84 conditions of consent and three EPA general terms of approval requirements prior to issue of construction certificate and EPA scheduled development works licence. • Provided in kind support (free tipping) to Local Area Land Councils (LALC) to undertake clean-up of illegally dumped waste on aboriginal land in Bournda. • Introduced a new data recording format and database for waste disposal data. • Closed illegal community waste burning activity at Wonboyn Lake landfill. • Recruited eight permanent field staff to operate seven waste facilities seven days per week, along with a casual pool and a waste education and projects officer.	47. Undertake formal review of Council's 2020 Vision on Waste Strategy with the community and new Councillors. 48. Include illegal dumping minimisation as an objective in the new Delivery Plan. 49. Develop an illegal dumping regulation plan and establish a customer request and staff reporting process and workflow to ensure that all reports of illegal dumping are recorded and subsequently investigated. 50. Continue involvement with the Southern Council's Group in establishing a Regional Illegal Dumping resource in the Bega Shire funded through NSW EPA grants.
CSP Key Direction: A10: Waste	**Addressed in SoE: 2.4 – Waste management**
A10.2 Provide and manage kerbside collection service for waste and recyclables.	
• Went to tender for new waste collection and transfer contracts including expansion of recycling services in rural areas (almost 2000 additional homes) potentially diverting around 1000 tonnes of recyclables from landfill each year.	

Driving forces

The driving forces section assesses Council's achievement towards the Strategic Priority, *S2: Manages development,* outlined in the Bega Valley Community Strategic Plan (CSP) 2011.

Population Change

Increasing population places pressure on the health of the environment with increased consumption of resources and production of waste impacting on the land, air, water and biodiversity. Urban expansion and production has meant that the majority of private lands within the Shire have been cleared of vegetation. This has threatened the survivability of some native plant and animal species, and impacted the health of catchments and integrity of some coastal lakes and estuaries.

Source: Australian Bureau of Statistics, Regional Population Growth, Australia (3218.0). Compiled and presented by .id the population experts

Figure 3: Bega Valley Shire Estimated Resident Population.

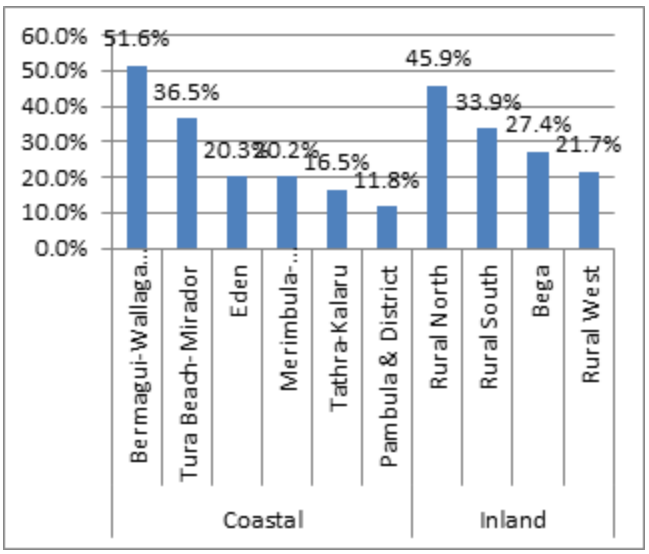


Figure 2: A regional breakdown of the forecasted percentage growth of the population by 2030. (Source, Informed Decisions, 2010)

Our population was 32,999 as of 30 June 2011. This was stable compared to the previous year, but is an increase of 2296 people or 7% since the 2001 census (Figure 3). Forecasts show that the Bega Valley population is to grow to over 41,000 people by 2030, about 27% larger than the current population.

A regional breakdown of the forecasted population shows that Bega and the Rural North Coast (which contains residential development spilling out of Bega) are expected to have the largest growth, up by 1,299 and 1,290 people respectively. In percentage terms, however, Bermagui will grow the fastest, increasing by 1.8% p.a. to reach 3,280 people by 2031 (Figure 2 & Informed Decisions, 2010).

Overall, the Bega Valley has an elderly population, representing ageing of the existing population, attraction of retirees and loss of young people. As a preferred retirement destination, the phasing of the Baby Boomer generation into retirement may drive

further population growth in the Bega Valley and certainly the forecasts, which show higher population growth in the next 25 years than the last 25, considers this as a factor for increased growth (Informed Decisions, 2012).

An ageing population will pose some different environmental pressures in the Bega Valley. Retiree settlement trends show an increased stress on coastal regions for urban expansion. This will pose an increasing challenge for Council to maintain the health of fragile coastal systems. In rural areas, the main challenge of an ageing population may be the migration of people away from the land, potentially posing land management issues around pest control and land capability management. Succession planning for the agricultural sector and maintaining viable populations in the smaller townships could provide a planning and management issue for Council (Informed Decisions, 2012).

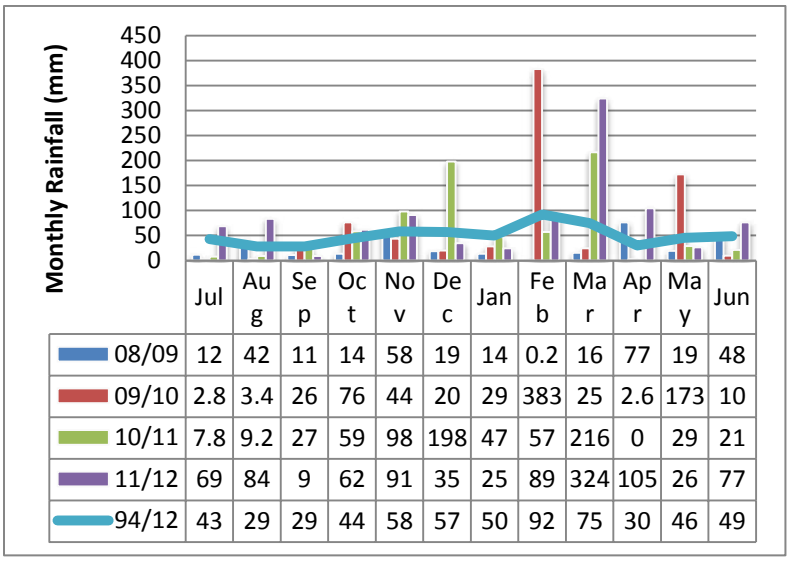
Weather and Climate

Any change in climate and its variability is a potentially serious issue for the Shire's economy due to our reliance on the agricultural sector, itself reliant on climate for continued profitability. Human induced climate change is predicted to further impact upon our climate and its variability at a magnitude exceeding natural forces.

The Bega Valley Shire's climate can be described as temperate with a well-defined warm summer and cool winter.

Rainfall

Rainfall was measured at the Bureau of Meteorology (BOM) Station, Bega AWS No. 069139. Rainfall was previously measured at BOM Station, Newtown Road No. 069002, with rainfall records dating back to 1879 and ending in 2009. BOM Station, Bega AWS No. 069139 is located 2.4 km from Newtown Road No. 069002 and has records dating from 1994 to the present.



	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
08/09	12	42	11	14	58	19	14	0.2	16	77	19	48
09/10	2.8	3.4	26	76	44	20	29	383	25	2.6	173	10
10/11	7.8	9.2	27	59	98	198	47	57	216	0	29	21
11/12	69	84	9	62	91	35	25	89	324	105	26	77
94/12	43	29	29	44	58	57	50	92	75	30	46	49

Figure 4: Total Monthly Rainfall (mm) at Bega AWS No. 069139 in 2008 to 2012 and long term average.

The 2011/12 period was dominated by a wet period with the largest rainfall on record at this station for March occurring in 2012, of 324 mm (Figure 4). The long drought was broken in 2009 with increasingly wetter years than the long term trend occurring in the following three years (Figure 5). These wetter years (2009-12) were characterised by

flooding events with two floods occurring in the 2010-11 period (Figure 4). This can be linked to strong La Nina events in the Pacific. The annual total for 2011/12 was 995 mm, higher than the long term average (1994-2012) of 599.2 mm (Figure 5).

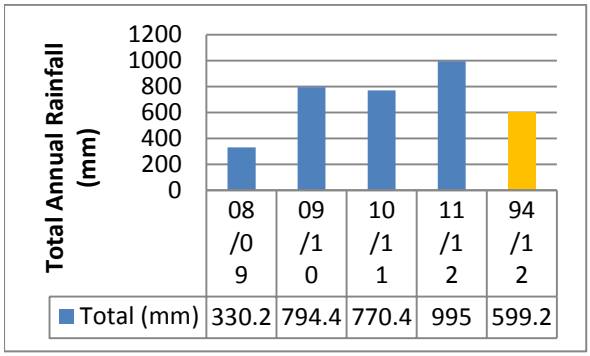


Figure 5: Total annual rainfall at Bega AWS No. 069139 in 2008 – 2012 and long term average.

Note: Station Name: BEGA AWS Station Number: 069139 · State: NSW · Opened: 1992 · Status: Open · Latitude: 36.67°S · Longitude: 149.82°E · Elevation: 41 m

The environmental impacts of a wetter period are numerous. Specifically, it may be linked to decreased water consumption for irrigation, energy consumption for the pumping of water for town water supplies, and reduced environmental releases to maintain environmental flow within rivers. Conversely, unlicensed sewer releases may be increased as systems cope with increased water fluxes, and algal growth may flourish in estuaries and coastal lakes with nutrients washed down river systems. Flooding has enormous economic ramifications for Council and residents alike with the replacement and repair of homes and infrastructure (Figure 6). The March 2012 floods also required the manual opening of Wallagoot Lake after 15 years of being closed to the ocean (Figure 7). This provided flushing of the system and exchange of biota and nutrients.

Figure 6: (left) Flooding in Bermagui township, 8 March 2012. (above) Flooding in East Street, Bega, March 2012.

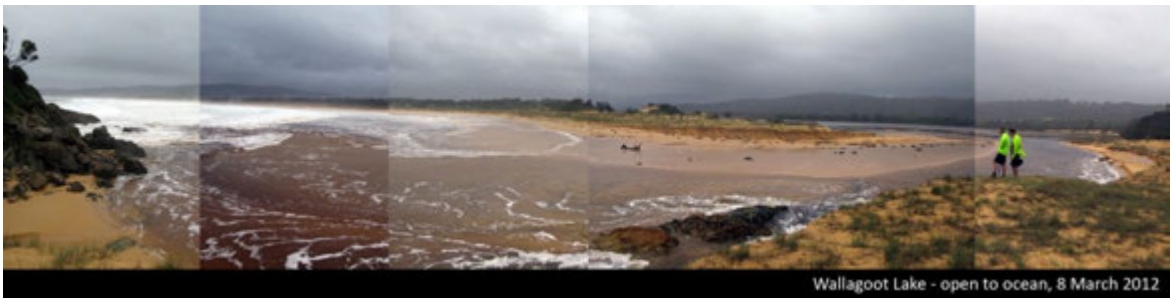
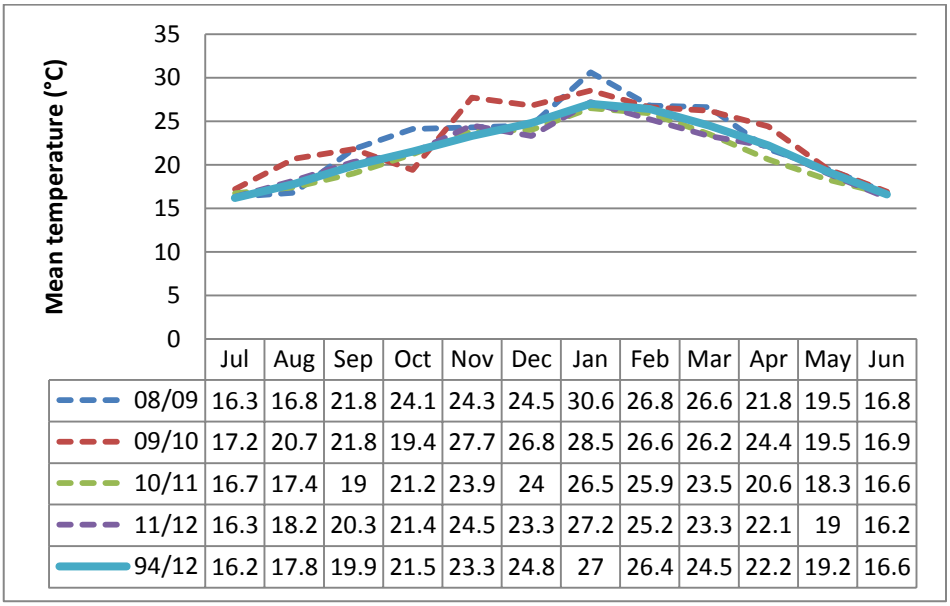


Figure 7: Wallagoot Lake was opened manually by Council on the 8th March 2012, after 15 years of being closed to the ocean when flooding threatened houses and infrastructure along Wallagoot Lake Road.

Temperature

Temperature was measured at the Bureau of Meteorology (BOM) Station, Bega AWS No. 069139. Overall the mean maximum temperature during 2011/12 and 2010/11 periods were relatively similar the long term trend (Figure 8). This is in contrast to the 2008/09 and 2009/10 periods which were generally hotter than the long term trend (Figure 8). During 2011/12, the maximum temperature recorded was 37.1 °C in January 2012 and the lowest daily maximum temperature was 11.5 °C in June 2012.



	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
08/09	16.3	16.8	21.8	24.1	24.3	24.5	30.6	26.8	26.6	21.8	19.5	16.8
09/10	17.2	20.7	21.8	19.4	27.7	26.8	28.5	26.6	26.2	24.4	19.5	16.9
10/11	16.7	17.4	19	21.2	23.9	24	26.5	25.9	23.5	20.6	18.3	16.6
11/12	16.3	18.2	20.3	21.4	24.5	23.3	27.2	25.2	23.3	22.1	19	16.2
94/12	16.2	17.8	19.9	21.5	23.3	24.8	27	26.4	24.5	22.2	19.2	16.6

Figure 8: Mean maximum temperatures at Bega AWS No. 069139 in 2008 – 2012 and long term average.

Climate change

Specific climate change predictions for the Bega Valley Shire include; increasing temperatures; decreasing annual rainfall; more frequent extreme weather events such as drought, floods & heatwaves; rising sea levels; increased bushfire frequency; acidification of ocean waters affecting some aquacultures and more intense storm surges (CSIRO, 2007).

Council seeks to maintain our Shire's unique natural beauty and the community's usability and enjoyment of the natural environment. The Shire includes many low-lying coastal communities and coastal and agricultural industries which are most vulnerable to the effects of climate change. Council maintains a network of sewerage and water infrastructure, roads, bridges and major recreational facilities which will be vulnerable to sea level rises and major flood events.

Early mitigation and adaptive actions are required to maintain the unique values of our Shire as well as to protect those sectors of the community and infrastructure most vulnerable to the effects of climate change.

Land Use

The way land in the Shire is used over time effects many aspects of the environment and life of the community. Economic development and provision of essential services, to transport and health care all rely on access to appropriate land. In addition, the health of our ecosystems and potentially our quality of life rely on effective land use rules. The community expects Council to undertake considered planning about what can be built where, and which parts of a town or village can be used for what purposes.

The South Coast Regional Strategy forecasts over 8000 new dwellings are anticipated in Bega Valley Shire by 2031, some of which will be for non-owner occupied or tourist use. To further address land management issues within the Shire, Council formalised and updated the Comprehensive Local Environmental Plan (CLEP) in 2012.

The CLEP was adopted by Council in June 2012 but is still awaiting approval by the Minister. It is based on standardised zoning classifications introduced by the NSW Government. This CLEP 2012 has introduced greater protection of waterways through environmental buffers and rigorous approval criteria in Clause 6.3 – Riparian land and Waterways. It also considers the risk of rising sea levels from climate change in Clause 6.6 – Coastal Hazards.

Through the development of the CLEP 2012, Council identified appropriate zoning, use and protection of the Shires natural resources and environmental values as high priorities for attention. The CLEP 2012 will provide the community and Council with a more effective tool for the proper management of our natural resources.

When applying new zonings, Council considered a range of factors including existing zonings, current and projected landuse, environmental values (e.g. biodiversity, soil and landscape protection, biodiversity, catchment and waterway protection) environmental hazards and wide range of data provided to Council from various State Government Agencies.

While acknowledging the need to appropriately protect the Shires natural resources, Council also wanted to ensure that the Shires primary agricultural areas were recognised and appropriately zoned.

Table 2 provides a summary of the CLEP 2012 zones as well as a percentage composition within the Shire.

Table 2: Land use zones within the Bega Valley Shire (descriptions are in the Comprehensive Local Environment Plan, 2012.

CLEP Zone	Size Ha	% of LGA	CLEP Zone name	CLEP Zone	Size Ha	% of LGA	CLEP Zone name
E1	252591.23	40.219	National Parks and Nature Reserves	R3	545.12	0.087	Medium Density Residential
RU3	160681.61	25.585	Forestry	RE2	339.22	0.054	Private Recreation
RU1	126481.32	20.139	Primary Production	SP2	264.11	0.042	Infrastructure

CLEP Zone	Size Ha	% of LGA	CLEP Zone name	CLEP Zone	Size Ha	% of LGA	CLEP Zone name
RU2	43907.47	6.991	Rural Landscape	SP3	142.71	0.023	Tourist
E3	27686.97	4.409	Environmental Management	SP1	95.52	0.0152	Special Activities
E2	6175.34	0.983	Environmental Conservation	W2	85.55	0.0136	Recreational Waterway
W1	4185.84	0.666	Natural Waterway	B2	84.67	0.013	Local Centre
R2	1391.8	0.222	Low Density Residential	E4	60.02	0.0096	Environmental Living
R5	1284.58	0.205	Large Lot Residential	B4	56.26	0.009	Mixed Use
RE1	687.19	0.109	Public Recreation	W3	19.25	0.003	Working Waterway
RU5	646.82	0.103	Village	IN2	18.11	0.003	Light Industrial
IN1	593.92	0.095	General Industrial	B1	8.7	0.001	Neighbourhood Centre

Themes and indicators

1. Water Management

Bega Valley Shire enjoys drinking water of a very high standard. There is generally good water quality within our rivers, estuaries and near shore marine waters. Effectively managing these water supplies is critical for agricultural production, domestic and business use and environmental health. Prolonged declines in average rainfall across the Bega Valley Shire have meant that managing our water resources will remain a key challenge for decision makers and residents. Variable rainfall requires a focus on land use planning, natural resource and demand management to protect the quality and quantity of water. Council undertakes targeted water quality programs which focus on drinking water supplies, recreational water bodies and effluent reuse environments.

The water management section assesses Council's achievement towards the Strategic Priorities: *S1: Natural environment protected, S3: Living sustainably, S5: Total water cycle management, S7: Health of natural systems, A8: Water and A9: Sewerage,* outlined in the Bega Valley Community Strategic Plan (CSP) 2011.

The Council's Water Asset Management plan outlines the following strategic objectives for operating and maintaining the water supply systems in accordance with the CSP 2011:

1. To provide safe drinking water to areas where the demand exists and where financially feasible
2. To provide effective drought security and water demand management
3. Meet levels of service as defined by regulators

1a. Water Resources and Demand

The indicators used to assess Council's management of water resources against supplying the Shire's demand for water are outlined and described in Table 3.

Table 3: Indicators for assessing Council's management of water resources and consumers demand

Indicators	Measures	Description
1.1: Water Availability and Supply (including groundwater)	a) Dam volumes b) River environmental flows & Groundwater standing levels c) Total water extracted (surface & groundwater)	Measures total available water supply from surface waters (rivers, streams, lakes and reservoirs) and groundwater (if applicable).
1.2: Water Demand	a) Total water consumption b) Water use by sector	Measures the total annual water demand by domestic, industrial, commercial and rural sectors.
1.3: Drinking water quality	a) Drinking water quality	Measures the proportion of drinking water samples meeting the relevant Australian guidelines for drinking water quality.
1.4: Demand management responses	a) Demand management responses	Actions to reduce total water demand.

1.1 Water Supply and Availability:

Assessment: The Bega Valley Shire's reticulated drinking water system consists of a complex system of river weirs, off-stream storage dams, groundwater bores, reservoirs and pipelines. This system supplies base load requirements of residents as well as providing for peak demand during summer periods where the population of coastal towns temporarily triples with holiday makers.

Figure 9: Bega Valley Shire Council Town Water Supply Systems

The Council operates four water supply systems illustrated in (Figure 9). The capacity of the supply sources and ability to meet increasing population numbers is outlined in Table 4. For further information refer to: http://www.begavalley.nsw.gov.au/Environment/Water_Sewerage/water_systems.htm

Water supply issues in the southern part of the Shire was further secured with the construction of the Bega to Yellow Pinch pipeline commissioned in 2011 (discussed in more detail in the SoE 2010/11 Supplementary Report).

Table 4: Bega Valley Shire Town Water Supply Systems

	Water Extraction (ML/a)		
Town Water Supply System	**Average annual**	**Maximum capacity**	**Estimated future (2030) demand**
Tantawanglo – Kiah system	~2,000	~2,900	~2,900
Bega – Tathra system	~1,100	~5,000+	~1,300
Bemboka system	~40	~100+	~55
Brogo-Bermagui system	~380	~1,100	~600

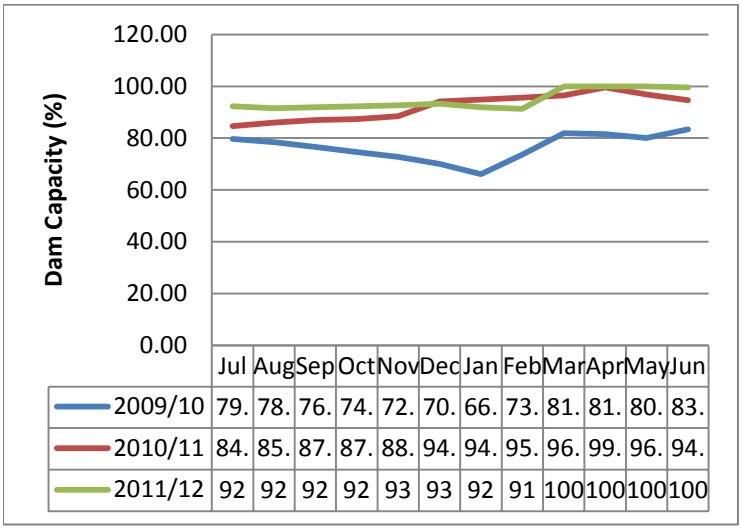
Implications: Water availability from surface and groundwater sources was high in 2011/12 due to a number of significant rain events during the last two and a half years that have replenished groundwater storages and surface water storages and flows.

The $24 million Bega to Yellow Pinch Pipeline commenced operations in the reporting year. Only small volumes were transferred to the dam because it was above 90% capacity for the entire reporting period. The completion of this project will enable Council to

manage water extraction from Tantawanglo Creek and the Kiah borefield in accordance with licence requirements and to recover used water from the dam faster during high flows in the lower Bega River at Bega.

a) Dam Volumes

Assessment: Water supply continued to be stabile during 2011/12 due to consistent rainfall (Figure 5). The off-stream storages of Yellow Pinch Dam and Ben Boyd Dam were above 90% storage capacity throughout the reporting year which is greater than previous years (Figure 10). This can be mostly attributed to rainfall with no significant requirement to pump or transfer additional water to recover stored water.



	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
2009/10	79.	78.	76.	74.	72.	70.	66.	73.	81.	81.	80.	83.
2010/11	84.	85.	87.	87.	88.	94.	94.	95.	96.	99.	96.	94.
2011/12	92	92	92	92	93	93	92	91	100	100	100	100

Figure 10: Dam volume percentage within the Ben Boyd and Yellow Pinch Dams, 2009-12.

Implications: There were no low-flow or low-groundwater level licence limitations on the extraction of water from sources. There were no water restrictions introduced by Council on the use of water supplied.

b) River environmental flows and Groundwater standing levels: The health of rivers and groundwater aquifers require careful management when regulating flow and extracting water as these can upset the complex natural balance, leading to the degradation of these resources.

Consequently, the NSW Office of Water developed Water Sharing Plans (WSP) with Local Councils to improve the sustainability of water management. The Council and Office of Water developed a plan for the Bega and Brogo Rivers Area which commenced on 1 April 2011 and can be found at: http://www.water.nsw.gov.au/Water-management/Water-sharing-plans/Plans-commenced/Water-source/Bega-and-Brogo-Rivers/default.aspx (Table 5). It provides for the sharing of water between the environment, town water supplies, basic landholder rights and commercial uses of water.

Critical to the new WSP's are IDELs (Individual Daily Extraction Limit), which are determined by the flow rate at gauging stations along urban water supply rivers which provide real-time data. Limiting the volume of water available for extraction according to stream flow, groundwater levels and other relevant water resource factors shown in Table 5, will help to protect low flows for environmental benefit and enable Council to manage demand in a more meaningful manner. Council was involved with developing the IDEL's over a long planning period with the Office of Water and other stakeholders from 2002-2010. The IDEL's were determined based on analysis of historical water resource data,

town water supply system capacity modelling and consideration of other catchment water user needs (e.g. irrigators, riparian rights users, stock & domestic users). Council now has a framework to model and plan water supply system capacities during drought and other times and thereby design and construct infrastructure to ensure the long term security of town water supply.

Currently there is no data with any reasonable length of time to assess Council's performance in managing water supply under low flow conditions under the new WSP's.

Table 5: Rules for the Water Sharing Plan for the Bega and Brogo Rivers Area Unregulated, Regulated and Alluvial Water Sources (2011).

WATER SHARING PLAN	WATER SOURCE		SHARE COMPONENT	WATER SUPPLY SYSTEM	FLOW CLASS	FLOW	FLOW OBSERVATION	GROUNDWATER LEVEL	DAM STORAGE LEVEL/RELEASE	IDEL	WSP CLAUSES
	WSP	BVSC	ML/y	BVSC		ML/d		mAHD	% FSL or release regime	ML/d	
			Local Water Utility			*Gauging Stn*	*Location*	*Bore number*	*Dam name*		*Part & Division*
Bega and Brogo Rivers Area Regulated, Unregulated and Alluvial Water Sources 2011	Mid Bega River Sands	**Bega borefield**	2640	Bega-Tathra & Bega to YPD		*Kanoona*	*downstream of Princes Highway Bridge*	*GW039001*	*Yellow Pinch Dam*		*Part 9 Division 3*
					C	>160	visible surface flow	>5.5	n/a	unlimited	
					B	160 to >65	visible surface flow	>5.5	n/a	12.8	Clause 69 (b) (iv) (2)
					A2	<=65	visible surface flow	>5.5	n/a	6.7	Clause 69 (b) (iii) (2)
					A1	<=65	no visible surface flow	>5.5	n/a	4.7	Clause 69 (b) (ii) (2)
					Low Flow	<=65	no visible surface flow	5.5 to 4.5	n/a	4.7	Clause 69 (b) (i) (2)
					Very Low Flow	<=65	no visible surface flow	<=4.5	n/a	3.5	Clause 65 (16) (f)
	Tantawanglo Creek	**Tantawanglo Creek weir**	1500	Tantawanglo-Kiah		*Tantawanglo Mtn*	*n/a*	*n/a*	*n/a*		*Part 9 Division 3*
					n/a	>10	n/a	n/a	n/a	5	Clause 66 (4) (b) (i)
					n/a	10 to 4	n/a	n/a	n/a	50% of flow	Clause 66 (4) (b) (i)
					n/a	4.0 to >2.2	n/a	n/a	n/a	Flow - 2.0	Clause 66 (4) (b) (ii)
					n/a	2.2 to >0.4	n/a	n/a	n/a	0.2	Clause 66 (4) (a) (ii)
					n/a	<=0.4	n/a	n/a	n/a	50% of flow	Clause 66 (4) (a) (i)
	Upper Bega/Bemboka Rivers	**Bemboka River**	66	Bemboka		*Kanoona*	*n/a*	*n/a*	*Cochrane Dam*		*Part 9 Division 3*
					B	160 to >65	n/a	n/a	No drought reserve release	0.2	Clause 69 (a) (ii) (2)
					A	65 to >5	n/a	n/a	No drought reserve release	0.2	Clause 69 (a) (i) (2)
					Low Flow	5 to >2	n/a	n/a	No drought reserve release	0.2	
					Very Low Flow	<= 2	n/a	n/a	No drought reserve release	0.2	Clause 65 (16) (e) (i)
					Very Low Flow	<= 2	n/a	n/a	Drought reserve release	0.1	Clause 65 (16) (e) (ii)
	Bega and Brogo Regulated Rivers	**Brogo River**	700	Brogo-Bermagui		*n/a*	*n/a*	*n/a*	*Brogo Dam*	*n/a*	*Part 9 Division 2*
					n/a	n/a	n/a	n/a	n/a	n/a	
Towamba River Unregulated and Alluvial Water Sources 2101	Lower Towamba R	**Kiah borefield**	1400	Tantawanglo-Kiah		*Towamba*	*downstream of Kiah borefield*	*GHD2*	*Ben Boyd Dam*		*Part 8 Division 2*
					C	>34+	visible surface flow	n/a	>=50	12	Clause 43 (a) (iv) & 44 (c)
					B	34 to >15	visible surface flow	n/a	>=50	6	Clause 44 (b) (iii)
					A	15 to >5	visible surface flow	n/a	>=50	3	Clause 44 (a) (ii)
							no visible surface flow	n/a	>=50	1	Clause 44 (a) (iii)
					Low Flow	5 to >0.5	no visible surface flow	n/a	>=50	1	Clause 42 (6) (b) (i)
									<50	2.5	Clause 42 (6) (b) (ii)
					Very Low Flow	<=0.5	no visible surface flow		>=50	1	Clause 42 (6) (b) (i)
									<50	2.5	Clause 42 (6) (b) (ii)

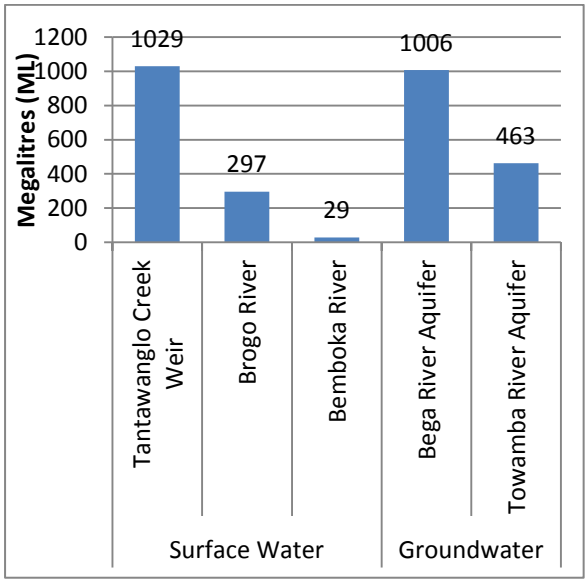


Figure 11: Total water extraction (surface and ground water) in the Bega Valley Shire in 2011/12.

b) Total water extraction (surface and ground water):

Assessment: The total water extracted for town water supply in 2011/12 was 2824 ML and was sourced almost equally from surface and ground water sources (Figure 11).

Implications: Council successfully managed water supply in accordance with licence requirements in 2011/12. However, good rainfall prior to and during the reporting period restocked water supplies, easing restrictions on its supply.

WSP's will provide for more sustainable water management and better environmental outcomes with the focus on reducing reliance on river and groundwater sources during times of low stream flows. Therefore future SoE reporting will assess Council's water management performance against compliance with IDEL's as a more meaningful assessment of sustainable management than indicators such as "dam fullness" and "total water extraction from surface & groundwaters". This is because under the new management, dams will undergo deeper cycling during times of low stream flow which is not comparable with previous management practices.

1.2. Water Demand:

a) Total water consumption

The total annual water supplied to the Bega Valley Shire during 2011-12 was 3270 ML (Figure 12).

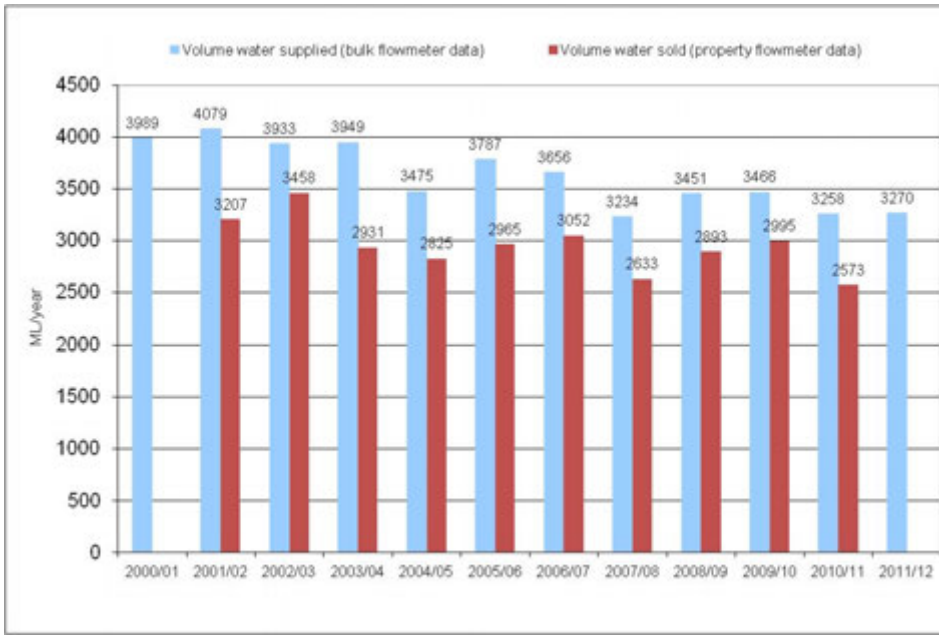


Figure 12: Total annual water consumption the Bega Valley Shire between 2002 and 2012.

Implications: Water consumption was slightly higher in 2011/12 than the previous year but is in keeping with a general declining trend in consumption, despite increasing population.

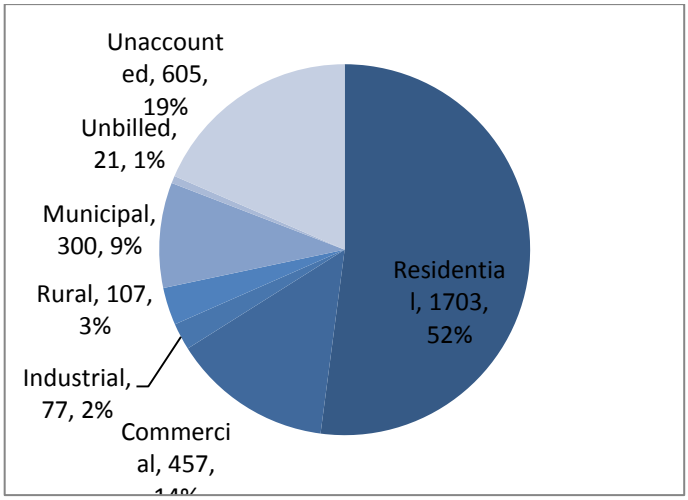


Figure 13: Total water use by sector in the Bega Valley Shire in 2011/12 in Megalitres.

b) Water use by sector

Assessment: The residential sector continues to be the highest consumer of water, equating to 52% of total water consumption within the Shire (Figure 13). Residential water consumption is slightly higher than the previous reporting period but is in keeping with a general declining trend in consumption (Figure 14).

The unaccounted water category comprises 19% of the Shire's water use making it the next highest sector followed closely by the commercial sector at 14% (Figure 13). The Unbilled sector (1%) comprises of water used for flushing mains and also fire fighting.

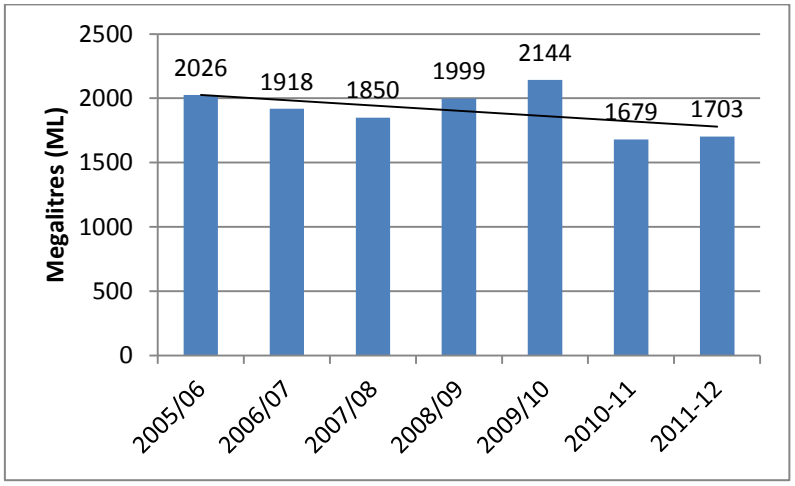


Figure 14: Residential water consumption of reticulated drinking water between 2005 and 2012 in the Bega Valley Shire.

Implications: The unaccounted water category is due mostly to inaccurate meter readings underestimating consumption as well as some leaks and evaporation. In response, Council is undertaking a meter replacement program to allow for more accurate readings as well as regular maintenance of infrastructure to reduce leaks.

Residential water consumption rates have generally declined over a six (6) year period despite an increase in population suggesting the successful implementation of demand management responses (outlined in Section 1.4).

1.3. Drinking Water Quality

Assessment: Drinking water quality provided in the reticulated supplies for the reporting period remained of an excellent quality (Table 6). Four hundred and ninety-one (491) separate microbiological samples were taken to determine water quality and 100% met the Australian Drinking Water (ADW) Guideline requirements. Forty six (46) chemical samples were collected for analysis across the supply network and all except for turbidity, iron and copper met the criteria 100% of the time. Two results for turbidity, four results for iron and one result for copper marginally exceeded the relevant guidelines though for non-health related aesthetic criteria (taste & colour).

Table 6: Drinking water quality in 2011/12

DRINKING WATER QUALITY 2011 / 2012						
Parameter	**No. Samples**	**ADW Guideline**	**Min**	**Max**	**Exceptions**	**% meeting ADW Guideline**
E. coli	491	0.00 cfu/100ml	0	0	0	100.00
Total Coliforms	491	0.00 cfu/100ml	0	4	1	99.80
pH	48	6.5-8.5	6.8	8.1	0	100.00
Turbidity	46	5.00 NTU	0.85	4.6372	2	95.65
Total Dissolved Solids	46	600.00 mg/L	47	192	0	100.00
Free Chlorine	517	5.000 mg/L	0.03	2.20	0	100.00
Total Chlorine	517	5.000 mg/L	0.05	2.20	0	100.00

DRINKING WATER QUALITY 2011 / 2012						
Copper	46	2.000 mg/L	0.008	0.3823	1	97.43
Fluoride (WU Result)	52	1.5000 mg/L	0.80	1.07	0	100.00
Iron	46	0.3000 mg/L	0.1800	0.3620	4	91.30
Manganese	46	0.5000 mg/L	0.0025	0.0228	0	100.00
Zinc	46	3.000 mg/L	0.005	0.0264	0	100.00

(Ref. NSW Health 2011/2012)

Implications: Drinking water provided by Council is consistently of an excellent quality throughout the reporting periods.

1.4. Demand Management Responses

The Council implements a rigorous demand management plan which utilises mechanisms such as a high water usage charge ($2.27/kL), education and awareness (e.g. information on water usage notices), permanent water wise measures and sewerage & stormwater reuse initiatives.

These measures have been shown to be effective through a decline of water use per connected residential property from 184 kL per connected residential property in 2001/02 to 140 kL per connected residential property in 2011/12, representing a 24% decrease in the amount of water used per household in 10 years.

Council has developed a Demand Management Plan to further reduce water consumption and targets the "Unaccounted" sector (water losses & inaccurate meters). These are discussed further in the Water Supply Asset Management Plan (http://www.begavalley.nsw.gov.au/cp_themes/default/page.asp?p=DOC-EMB-10-04-65) and are outlined in Table 7.

Table 7: Town water demand management plan

Service Activity	Demand Management Plan
Meter replacement program	Replacement of meters >10 yrs to balance the system input volume to the volume consumed by customers.
Pressure management	To reduce the number of new breaks and all leak flow rates
Speed and quality of repairs	To minimise the run time of all leaks and breaks
Water Loss Management Program includes (Active leakage control – night time flow method/reservoir drop testing)	Installation of flow meters in key locations – to identify and fix unreported leaks and breaks
Pipeline and assets management	Selection, installation, maintenance, renewal and/or replacement

1b. Water Quality

The following indicators used to assess Council's management of water quality are outlined in Table 8, address Strategic Priority S5: Total water cycle management of the CSP 2011 and expand upon these in accordance with the Sustainability Steps framework.

Table 8: Indicators for assessing Council's management of sewerage systems and land management practices on water quality

Indicators	Measures	Description
1.5: Discharge to waters (Sewage treatment plants & On-site sewage management systems (OSMs).	a) Sewage treatment plants (STPs) b) On-site sewage management systems (OSMs).	Assesses Council's management of STPs and OSMs with the aim of minimising contamination of surrounding waters from sewerage systems.
1.6: Surface water quality	a) Swimming water quality b) Estuary water quality	Assesses Council's management of STPs, OSMs and other land management in not contaminating surrounding waters.
1.7: Algal Blooms	a) Estuary monitoring b) Dam algal monitoring	Assesses Council's performance in managing estuary and dams to minimise toxic or artificially sustained algal blooms.
1.8: Riparian Vegetation	a) Riparian management responses	Actions to improve water quality through enhancing riparian vegetation.
1.9: Managing Water quality	a) Management responses	Actions to improve and maintain water quality.

1.5. Discharge to waters

The Council is responsible for ensuring the clean disposal of treated sewerage and liquid trade waste into surrounding waters through the operation of Sewage Treatment Plants (STPs) and regulation of On-site Sewage Management systems (OSMs).

a) Sewerage Treatment Plants

Assessment: The Bega Valley Shire Council operates ten (10) STPs that provide sewerage services to 18 towns, villages and localities within this area. The STPs are located as follows:

- Eden
- Merimbula-Pambula
- Tura Beach
- Tathra
- Bega
- Bermagui-Wallaga Lake
- Wolumla
- Candelo
- Kalaru
- Cobargo

Sewerage services are provided to approximately 25 000 people and 38 000 people during peak holiday times. There are approximately 11 000 residential properties and 900 non-residential properties connected to a Council sewerage system.

Council discharged a total volume of 1431ML treated sewerage into receiving waters in 2011/12 in accordance with Pollution Control Licences (Table 9). During the reporting period the sewerage system performed adequately with only 62 unauthorised surcharges

or chokes (Figure 15). These were all minor events with negligible impact on the receiving environment and none triggering a report formally to the NSW Office of Environment and Heritage, now to NSW EPA.

The volume of treated effluent reused increased by 38 ML since the previous reporting period (Table 9).

Table 9: Discharges from the Sewerage Treatment Plants during the 2010/11 & 2011/12 periods.

Sewage Effluent Management	2010/11	2011/12	Comment
Number of unlicensed sewer discharges	69 (1 EPA report)	62 (0 EPA report)	Chokes and associated surcharges
Estimated volume of unlicensed sewer discharges	150-400	150-400	kL estimate
Volume effluent discharged to receiving waters	1450	1431	ML
Volume effluent reused	447	485	ML
Total number of liquid trade waste connections	400	400	estimate
Total number of new liquid trade waste connections	5	5	approximate

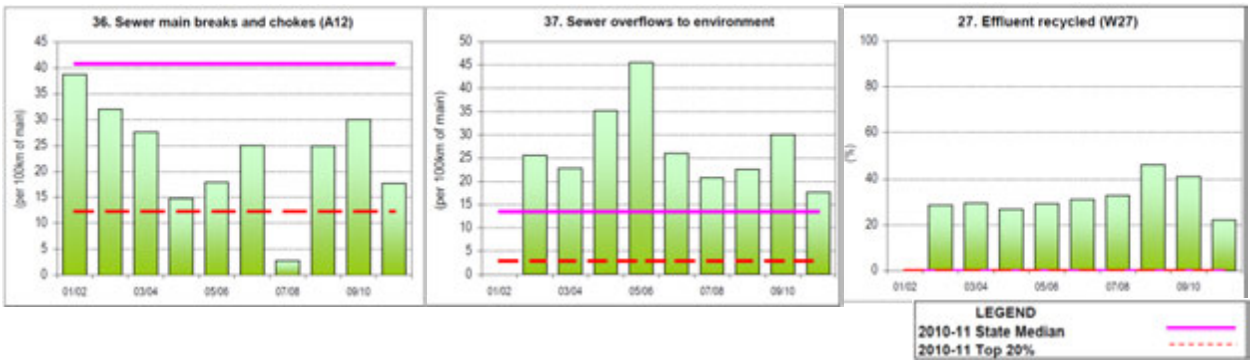


Figure 15: Sewer main breaks and chokes, volume of overflows to the environment and percentage recycling of effluent for the BVSC.

Implications: Strategic Business Plans remain current for both Water and Sewerage management. The Bega Valley Sewer Project continues to have a very large positive environmental impact through the increased number of dwellings and businesses able to connect to the reticulated sewerage schemes across the major areas of the Council region.

Each of Council's 10 STP's are able to supply effluent for use on a nearby golf course, playing field, showground or farm. In 2011/12, 485ML of treated effluent was reused across Council's ten (10) reuse schemes which is an increase from the previous reporting period but a decrease from the 2009/10 period. This is due to increased rainfall and a cooler summer decreasing the demand for reuse water.

Effluent reuse has a direct benefit to the environment. However, the demand for effluent varies with seasons and weather. Reuse is maximised in summer when irrigation areas have a soil moisture deficit and demand for effluent is high. In winter and during wet times, the demand for effluent is low and effluent is disposed. This leads to variability in the volumes of effluent reused from a dry year to a wet year. Assessment of variability in

volume of effluent reused should consider seasonal conditions as well as any changes to storage capacity.

New effluent reuse schemes are being investigated to further increase the volume of effluent reused, particularly for Merimbula STP. New effluent reuse schemes are assessed in the context of social, environmental and financial criteria for effluent management. Capital costs (eg. effluent dam, pipework and pumps) and ongoing operational costs (eg. pumping, greenhouse gas emissions) are being considered carefully in terms of the social and environmental benefit of a scheme compared to that of effluent disposal. A key constraint is constructing effluent storages (dams) to store winter effluent volumes and volumes produced during wet times. For example, at Merimbula STP, over 200 megalitres of effluent is produced during the time of year when there is very little irrigation demand for it. Local topography, land availability, dam permeability requirements and other factors restrict the size of dams that can be built.

Council continued to increase the number of tradewaste connections within the sewered areas of the Shire, thereby reducing the number of chokes and subsequent sewer spillages. This is discussed further in Section 1.9: Managing Water Quality.

b) On-site Sewage Management Systems (OSM)

OSMs are not connected to Council's sewerage system and include septic tanks, pump-out systems, aerated wastewater treatment systems, composting toilets, effluent soak-away trenches, mounds and irrigation areas, grey water application systems and domestic grease traps.

Failing OSMs can release dangerous levels of sewage to the environment. Sewage pollution causes contamination of water, which can spread disease resulting in increased risk to public health and lead to environmental degradation. The cumulative impact of effluent can create a critical problem.

Figure 16: Failing system of onsite sewage management with raw untreated effluent discharging from the septic tank

Assessment: In 2008, Council adopted an "Onsite Sewage Management Strategy" which provides a framework for the management of on-site sewage disposal systems throughout the Shire and ensures compliance with relevant public health and environmental legislation.

There are approximately 5550 known OSM's within the Shire. On-going development in rural and semi-rural areas will result in more systems being installed, however, the continued connection of homes to the Shire's sewerage systems has resulted in a decrease in the overall number of systems in the BVSC region since the 2010/2011 reporting period (Table 10).

Table 10: BVSC's management of onsite sewerage management systems (OSM) - 2010 to 2012.

	2010/11	2011/12
Total No. OSM's in Shire	5644	5541
No of new approved OSM's	112	53
No of OSM's connected to sewer	6	3
No of OSM inspections	1054	1239
No. of improvement orders served	111 (intention), 1 (served)	3

Council implements an approvals and inspection regime aimed at achieving environmental and public health performance objectives, while minimising cost to the community. Following this process an ongoing monitoring regime is conducted, based on the level of potential hazard determined for each property / facility. Council in the previous 12 months undertook 1239 inspections of OSMs across the Shire (Table 10). Council aims to inspect each facility and issue a one to ten year approval to operate a sewage management facility based on the risk level posed by the OSM. Inspections of existing facilities and all new applications are assessed with consideration of the following:

- Prevention of public health risk;
- Protection of lands;
- Protection of surface waters;
- Protection of ground waters;
- Conservation and reuse of resources; and
- Protection of community amenity

Following last year's inspection program 53 property owners were issued with improvement notices requiring them to undertake repairs or upgrades to their OSMs.

OSM inspections initially targeted areas of high risk to environment and public health, including drinking water catchments and catchment areas associated with shellfish harvesting.

Progression throughout the Shire shall continue with the larger unsewered and environmentally sensitive areas continued to be given priority. Priority will also be given to systems where a monitoring regime has not yet been established and an initial inspection is still required.

Implications: The OSM program provides effective education, support and supervision to landowners, so that their systems operate in accordance with the health and environmental performance standards. The program also monitors and manages the cumulative impact of sewage pollution across the BVSC region.

In order to adequately measure the outcomes of an environmental management strategy, selected indicators must be identified and monitored from the outset of the process. Where possible Council will maintain and develop programs in cooperation with relevant authorities, State agencies, and community groups, to monitor the impact of on-site sewage management on the environments.

Significant benefits will be realised where environmental assessment and monitoring activities can be conducted on a regional or catchment basis.

Council's Sewage Management Strategy will be reviewed following changes to guidelines implemented by NSW Department of Local Government to ensure a consistent approach in on-site sewerage management across NSW.

1.6. Surface Water Quality

Figure 17: Bega Valley Shire Council's Beachwater sampling program.

a) Swimming Water Quality

Assessment: Beaches in the Bega Valley Shire had high water quality and were suitable for swimming for the majority of the 2011/12 swimming season, despite above average rainfall (OEHa, 2012). Thirteen swimming locations were monitored and tested for presence and concentration of enterococci, an indicator of suitability for human contact (Figure 17). Samples met the water quality criteria for recreational waters listed by the National Health and Medical Research Council (NHMRC) (OEHa, 2012 & Figure 18). Eleven swimming locations monitored were graded as "Very Good" and two locations (Bruce Steer Poor and Bar Beach) were graded as "Good" (Figure 18). Bruce Steer Poor and Bar Beach received elevated results on a couple of occasions and posed an increased risk of illness to swimmers. Heavy rainfall was associated with the occasionally poor results with urban runoff or river discharge identified as being potential sources for microbial contamination (OEHa, 2012).

Figure 18: Sampling locations and Beach Suitability Grades in the Bega Valley Shire Council area (Source: Beachwatch Report OEH 2011/12).

The full Beachwatch report can be found at: http://www.environment.nsw.gov.au/beach/reportann.htm

Implications: Monitoring of beach swimming water quality has been undertaken by Council since 1994 and has been had been conducted with Beachwatch since 2004 to better inform the local community of when and where it is safe to swim. The results of Council's monitoring program are posted weekly on Council's website during the swimming season as well as on the OEH Beachwatch website (above) for all historic results.

For the 2011/12 reporting period, water quality was very good at all of the sites monitored. The results did confirm

though that after periods of heavy rain beach water quality can be impacted on by stormwater runoff. As a consequence Council staff advised the community to avoid swimming for a day or so after heavy rainfall at ocean beaches, and for up to three days in estuarine sites due to potential impacts from stormwater.

c) Estuary Water Quality

There are 25 estuaries within the Bega Valley Shire, which represent 1/6 of the States estuaries (Figure 19).

Assessment: The surface water quality of local estuaries and coastal lakes are monitored through two programs; the NSW state-wide Monitoring Evaluation and Reporting (MER) program (DECCW, 2009a) and the Council's Estuary Health Monitoring program (Elgin, 2011a-f).

The state-wide MER program provides a regional snapshot of the condition of and pressures acting upon NSW estuaries. Most estuaries are sampled once every three years under this program with the spatial coverage of sampling limited. Council's Estuary Health Monitoring program commenced in 2010 to complement the state-wide program and increase the temporal and spatial coverage of MER monitoring. Six estuaries were monitored in 2010/11 including Baragoot Lagoon, Cuttagee Lake, Wapengo Lake, Middle Lagoon, Wallagoot Lake and Pambula Lake (Figure 20).

Merimbula Lake

Bermagui River

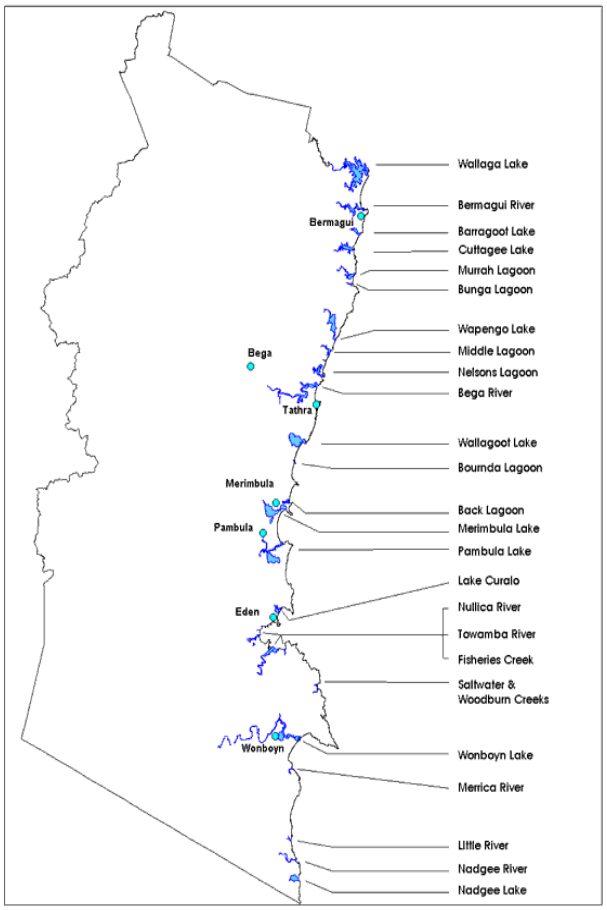


Figure 19: Estuaries of the Bega Valley Shire

The MER data was reported on in the NSW State of the Catchment Report (SoCR) (DECCW, 2011). Using condition and pressure indicators, it provided a score for each estuary (Table 11). The details of the program are discussed in the SOE 2010/11 Supplementary Report.

Of the 18 estuaries sampled for condition within the BVSC region, 5 scored "Very Good", 6 scored "Good", 5 scored "Fair" and 2 scored "Poor" (DECCW, 2011 & Table 11). No estuaries within the Shire scored a "Very Poor". It should be noted, however, that the surprisingly low scores for some of the estuaries within the BVSC region was due to incomplete data for some indicators creating a bias in the score.

Of the 27 estuaries assessed for vulnerability to pressures, most scored "Very Low", four (4) estuaries scored "Low" and five estuaries scored "Moderate" pressure (DECCW, 2011 & Table 11). No estuaries scored "High" or "Very High" pressure scores.

Trends in terms of pressures will not be able to be reported for some time though the 2010 SoCR does conclude that the main pressures occur along the south coast along the more developed and populated areas in the Illawarra and Shoalhaven regions.

Table 11: Estuary condition and pressure evaluations from seven condition indicators and eight pressure indicators (DECCW, 2011)

Name	Condition	Pressure	Name	Condition	Pressure
Little Lake (Wallaga)	ND	Moderate	Pambula River	Good	Very low
Wallaga Lake	Poor	Moderate	Curalo Lagoon	Good	Low
Bermagui River	ND	Moderate	Shadrachs Creek	ND	Very low
Baragoot Lake	Poor	Very low	Nullica River	Fair	Very low
Cuttagee Lake	Good	Very low	Towamba River	Very Good	Very low
Murrah River	Very Good	Low	Fisheries Creek	ND	Very low
Bunga Lagoon	Fair	Very low	Twofold Bay	ND	Very low
Wapengo Lake	Very good	Very low	Saltwater Creek (Eden)	ND	Very low
Middle Lagoon	Good	Low	Woodburn River	ND	Very low
Nelson Lagoon	Fair	Very low	Wonboyn River	Very Good	Very low
Bega River	Good	Low	Merrica River	ND	Very low
Wallagoot Lake	Very Good	Very low	Table Creek	ND	Very low
Bournda Lagoon	ND	Very low	Nadgee River	ND	Very low
Back Lagoon	Good	Moderate	Nadgee Lake	Fair	Very low
Merimbula Lake	Fair	Moderate			

Council's Estuary Health Monitoring program: Two monitoring cycles have been undertaken in 2010/11 & 2011/12. The program involves quarterly monitoring and includes measurement of a number of physical and biological parameters using protocols consistent with OEH's MER program to address data gaps and assist council to develop an environmental profile for several of its coastal lakes. Council was awarded funding under the *NSW Government's Estuary Management Program Grants 2012/13* to continue the program and will extend the program to include monitoring at a further four estuaries including Bermagui and Bega Rivers, Merimbula Lake and Curalo Lagoon.

A snapshot of the 2010/11 water quality results for six estuaries is provided in Figure 20. Detailed data and analysis can be found in the draft reports (Elgin 2011a-f). These are

available from Council on request. The 2011/12 data analysis was not yet available at the time of this report.

Implications: Results of seasonal estuary monitoring under the Council's Estuary Health Monitoring program provide a clearer understanding of estuarine processes that are unique to each estuary. These show that lakes such as Baragoot that scored a "Poor" in the NSW state wide MER results (DECCW, 2011), typically have a high surface water quality, but may be heavily influenced by seasonal changes in natural processes such as winds and biota populations (Elgin, 2011a). This monitoring program provides valuable MER data across four seasons and supplements the state-wide MER sampling program.

Baragoot Lake: "*is a well mixed, shallow estuary with average depths estimated to be 0.6 m (OEH 2011a). Pressures on Baragoot Lake in terms of nutrient inputs and catchment disturbance are rated as low to very low (DECCW, 2011). However, due to the shallow nature of the lake and consequently its large sediment to water volume ratio, wind induced turbulence easily stirs up the bottom sediments and can result in sustained high nutrient levels in the water column leading to degraded water quality conditions. Combined with the fact that the lake is usually closed to the ocean and only intermittently flushed, the lake inherently has a small capacity to buffer any added nutrient inputs, hence its high vulnerability classification by DLWC (2000). With the exception of autumn, water quality of Baragoot Lake was considered good despite sustained high levels of nitrogen and chlorophyll a above the recommended MER and ANZECC guidelines*" (Elgin, 2011a).

Cuttagee Lake: Water quality was generally very good with high water clarity, low levels of nutrients and low levels of chlorophyll *a* (Elgin, 2011b &

Figure 20). Seagrass was sparse to absent, supporting the trend found in the 2006 NSW DPI assessment of 10-40% estimated losses of seagrass in the lake over a 20 year period from 1986 to 2006 (Willians *et al,* 2006). Elevated nutrient concentrations following rainfall in the catchment were evident in summer though this trend was not apparent in autumn following above average March rainfall and presumably significant catchment inflows during this period (Elgin, 2011b).

Middle Lagoon: *"Middle Lagoon is a well mixed, shallow estuary with average depths estimated to be 0.7 m (OEH 2011a). Pressures on the lagoon in terms of nutrient inputs and catchment disturbance are rated as moderate to low (DECCW 2011). However, due to the shallow nature of the lake and consequently its large sediment to water volume ratio, wind induced turbulence is able to resuspend bottom sediments and can result in sustained high nutrient levels in the water column which may contribute to degraded water quality conditions. Combined with the fact that the lagoon is typically closed to the ocean and only intermittently flushed, the lake inherently has a small capacity to buffer any added nutrient inputs, hence its high vulnerability classification by DLWC (2000). Water quality of Middle Lagoon was considered good despite sustained elevated levels of nitrogen and 'chlorophyll a' above the recommended MER and ANZECC guidelines*" (Elgin, 2011c).

Pambula Lake: "*is a well mixed, moderately deep estuary with generally high levels of water clarity and dissolved oxygen in the central basin. Pressures on the lake in terms of nutrient inputs and catchment disturbance are rated as low to very low with habitat disturbance from jetties, moorings, reclamation walls and oyster lease infrastructure rated as a moderate pressure (DECCW, 2011 &*

Table 11). Nutrient levels including total nitrogen, NOx, ammonium, total phosphorous and ortho-phosphate were generally below ANZECC guidelines with elevated levels of the various nutrient parameters recorded intermittently during the monitoring program" (Elgin, 2011d).

Wallagoot Lake: "is a deep estuary with basin depths ranging from 5 - 9 m and has large water to catchment area ratio, with much of the catchment forested. Pressures on Wallagoot Lake in terms of nutrient inputs and catchment disturbance are rated as low to very low (DECCW 2011 & Table 11) and the lake inherently has a large buffering capacity for nutrient inputs that do occur. Overall, surface water quality was high during the monitoring period with most water quality objectives met for the protection of aquatic ecosystem of Wallagoot Lake" (Elgin, 2011e).

Wapengo Lake: is a well mixed lake due to tidal flushing, wind advection and hydraulic turbulence. Pressures on Wapengo Lake in terms of nutrient inputs and catchment disturbance are rated as low to very low (DECCW 2011 & Table 11). Overall surface water quality was consistently high with nutrient levels highest in summer with concentrations slightly exceeding ANZECC guidelines (Elgin, 2011f & Figure 20).

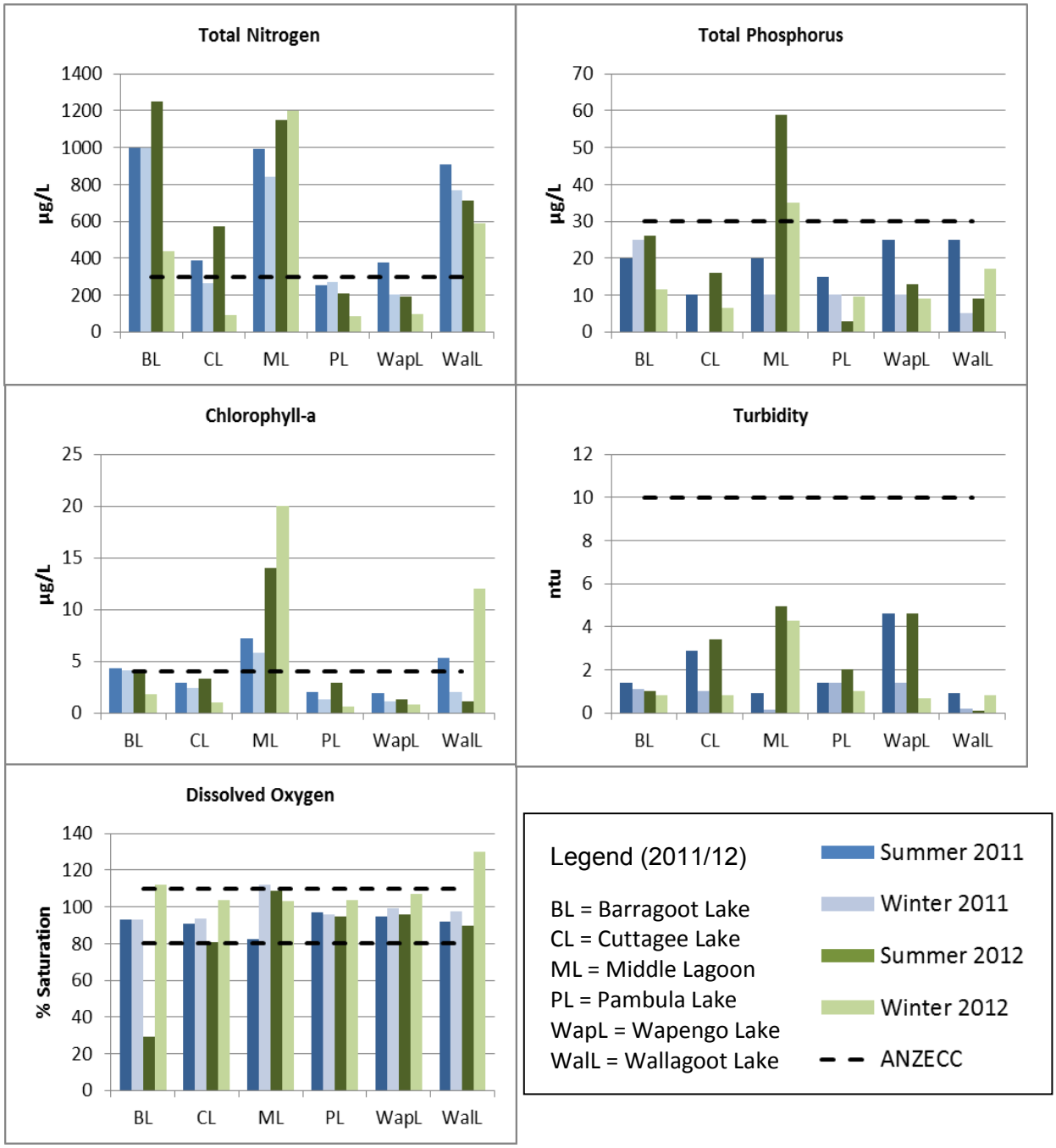


Figure 20: Water quality results for 6 estuaries and lakes (Barragoot Lake, Cuttagee Lake, Middle Lagoon, Pambula Lake, Wapengo Lake & Wallagoot Lake) within the Bega Valley Shire against ANZECC (2000) water quality guidelines (2010/11). (Source: Elgin 2011a-f).

1.7. Algal Blooms

a) Estuary monitoring

Algal populations are monitored in 10 important estuaries within the Shire as part of the Council's Estuary Health Monitoring Program (discussed in Section 1.6c). Concentrations of *chlorophyll a* (ug/L) are measured to assess abundance of microalgal communities in waterbodies. All algae respond to nutrient inputs with algal blooms considered to be symptomatic of excess nutrient loads and therefore flags a land management issue/s in the catchment. However, *chlorophyll a* does not take into account the presence or

prevalence of macroalgae. Assessing macroalgal blooms in estuaries has proven difficult due to the heterogeneous and sporadic nature of macroalgae and the absence of any clear guidelines/protocols in the MER program of how to assess macroalgal blooms. Council is recording the presence and diversity of macroalgae in each of the ten estuaries to understand the cyclic trends and species dominance of macroalgae in each of the estuaries with a view to developing an appropriate protocol.

There have been no blooms of microalgae within monitored estuaries in the Shire since the commencement of monitoring in 2010. Some of the results have exceeded levels deemed to reflect reference conditions; however, in most cases chlorophyll a levels have been below guideline values. For some estuaries like Wallagoot Lake, Baragoot and Middle lagoon, there have been some periodic macroalgal blooms but they have not persisted all year. Taxonomic analysis shows that the macroalgae species common to these estuaries are not harmful to human health.

b) Water testing of water supplies

BVSC undertake routine monitoring of algae species and concentrations in Ben Boyd and Yellow Pinch Dams and adhere to response protocol if triggers are met.

Merimbula Bay Study: was a collaborative study between BVSC and OEH to investigate the effects of effluent discharged from the Merimbula sewage treatment plant (STP) ocean outfall on the occurrence of periodic algal blooms in Merimbula Bay between 2008 and 2012.

The study responded to widespread community concern that blooms were being sustained for longer periods and in greater abundance than normal due to sewerage derived nutrients discharged from the ocean outfall situated mid-way between Pambula and Merimbula beaches.

Using nitrogen isotopes found in sewerage effluent, the study found that algae was likely to be using nutrients from sewerage effluent where available, but that nutrients from diffuse sources such as catchments, periodic upwelling of slope water, groundwater discharge and the release of nutrients from the bay sediments were also important to the growth of the algae. This result supports anecdotal accounts dating back to the 1950's (prior to the construction of Merimbula STP in 1971), of large macroalgae blooms being a regular occurrence.

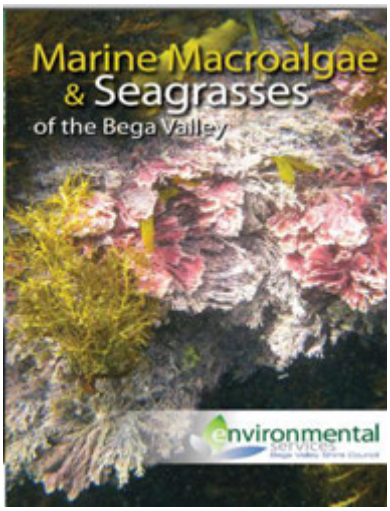


Figure 21: Marine Macroalgae and Seagrasses of the Bega Valley.

Community Education on Marine Macroalgae and Seagrasses: In response to community concerns regarding the safety of periodic algal blooms within estuaries and beaches, Council produced an educational brochure "*Marine Macroalgae and Seagrasses of the Bega Valley*" (Figure 21). The brochure is aimed at assisting identification of commonly encountered

seaweeds and seagrasses and the bloom potential of the seaweeds.

1.8. Riparian Vegetation

a) Management responses assessment:

Riparian buffers in Local Environment Plan

Protection of riparian vegetation and catchment water quality has been included at a local planning level into the 2012 Comprehensive Local Environmental Plan (CLEP), through Clause 6.3 – Riparian land and Waterways. Clause 6.3 provides a 40m buffer around all mapped waterways identified on the Bega Valley CLEP 2012 Water and Wetlands Map (Figure 22). Significant waterways, such as estuaries, are protected by a 100 m buffer under the Coastal Protection SEPP 71 and the BVSC subdivision provision of the Development Control Plan, 2007.

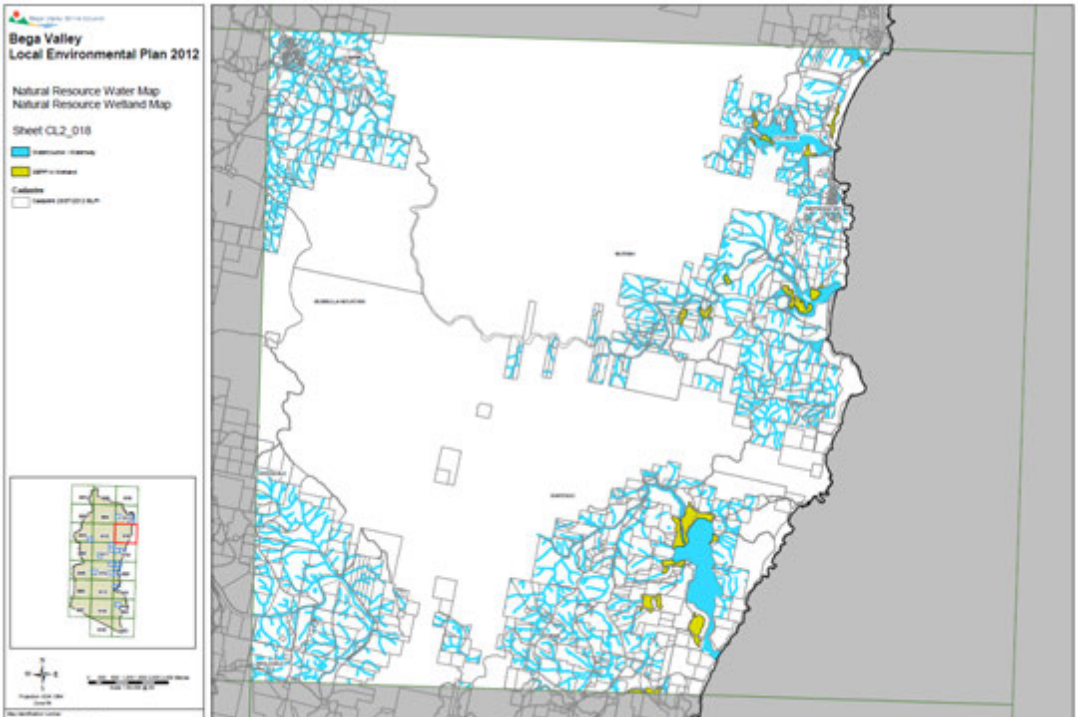


Figure 22: The Bega Valley Local Environment Plan 2012 Water and Wetlands Map.

Bega Cheese Environmental Management Systems Project (BEMS): aims to improve the environmental sustainability of dairy operations in the Bega River catchment, achieving improved water quality (Figure 23 & Figure 24). The program has run since 2005 and is a partnership of Bega Cheese, Southern Rivers Catchment Management Authority (SRCMA), NSW Department of Primary Industries, NSW Department of Water and Energy, Bega Valley Shire Council and local dairy farmers.

The program focuses on improving effluent systems, building laneways and crossings, protecting and enhancing riparian vegetation and wetlands, establishment of corridors / shelterbelts, erosion control and nutrient management.

Figure 23: Since 2005, the BEMS project has replanted 147 ha of riparian and wetland vegetation and 49 ha of terrestrial vegetation.

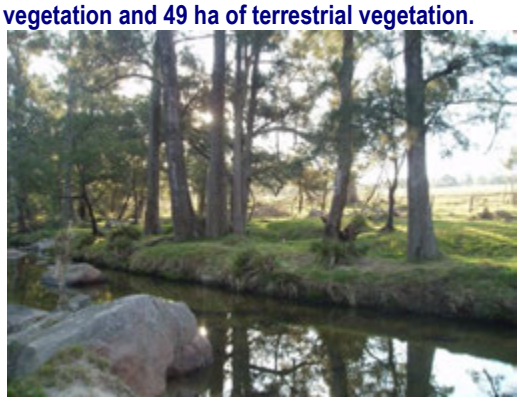


Figure 24: Of the 25% dairy farms surveyed as part of the Bega Cheese pilot BEMS, it was found that there was an average of 13% remnant native vegetation remaining on Bega farms.

Photos supplied by SRCMA.

To date, more than 85 per cent of Bega Cheese suppliers are participating in at least one aspect of the BEMS initiative.

Bega River riparian revegetation program: aims to improve the water quality of the Bega River through implementation of seven (7) on-ground riparian revegetation projects and provision of various extension services including awareness raising, media and technical advice. Partners include; landholders, community groups and government agencies (SRCMA, NSW Department of Lands and BVSC). During the 2011/12 period the program achieved the following:

- 100 ha (30 km of stream length) of weed control or riparian vegetation enhanced through control of Sagittiaria, willows and riparian fencing
- 5 hectares or 2 km of riparian revegetation
- 2 community group projects assisted
- 3 awareness raising events
- 6 media opportunities

The Pambula River rehabilitation program: was a collaborative program between landholders, oyster growers, community groups and government agencies (SRCMA, BVSC) to improve water quality through four (4) on-ground projects and provided various extension services including awareness raising, media and technical advice. During the 2011/12 period the program achieved the following:

- 14 ha (3.5 km of stream length) of weed control or riparian vegetation enhanced through control of willows and riparian fencing
- 1 hectare or 500 m of riparian revegetation
- 9 community group projects assisted
- 6 awareness raising events
- 6 media opportunities

Implications: While Council does not monitor riparian vegetation health specifically, river rehabilitation projects within the Shire have achieved improved outcomes for riparian vegetation, with beneficial results for the Shire's water quality. Collaborative programs that involve landholders and community groups have proved a successful model for maximising outcomes and to enhance the likelihood that achievements are ongoing.

1.9 Managing Water Quality

Council undertakes a number of programs and initiatives internally as well as with external partners to improve water quality within the Bega Valley Shire. These have been outlined in Sections 1.7, 1.8 and below.

Sewer discharge water quality: The Council's Water and Sewer Strategic Business Plans identify the following important future sewerage service planning issues to maintain and improve water quality:

1. Collection system upgrades to reduce occurrence of sewage overflows due to inflow and infiltration;
2. Treatment plant upgrades to improve effluent quality for better meeting of receiving environment requirements;
3. Effluent disposal and reuse system upgrades, particularly at Merimbula and Bermagui
4. Population growth and increasing sewage loads;
5. New capital works projects to meet future needs include:
    a) Disinfection facilities at Eden and Tura Beach STP's
    b) New effluent disposal system to replace existing shore-based outfall Merimbula STP

Estuary Management Plans: The BVSC has five Estuary Management Plans in place to ensure effective management of coastal and urban catchments. These include process studies and management plans for the Bega River, Wallaga Lake, Merimbula Lake/Back Lake, Lake Curalo and Wonboyn Lake.

Seasonal water quality monitoring continues for Barragoot Lake, Cuttagee Lake, Middle Lagoon, Pambula Lake, Wapengo Lake and Wallagoot Lake. This monitoring program provides valuable MER data across four seasons and supplements the state-wide MER sampling program

Urban Stormwater Management Plans: have been developed for the Bega Valley Shire Council and specifically for the Wallaga Lake and Wonboyn Lake areas.

Love Our Lakes Program: is an initiative of the BVSC, in collaboration with the SRCMA and local Oyster Growers, which has been running since 2010. The program will increase community awareness of the values of our estuaries and encourage community and industry participation in conservation, rehabilitation and education initiatives. The program received funding from the Australian Government's Caring for Country Grants and is supported by the Council's Estuary Management Program and the SRCMA.

Love our Lakes has undertaken educational talks at primary schools about the impacts of litter in stormwater. Educational signage is to be displayed along Merimbula, Pambula and Wonboyn Lakes promoting the lakes cultural and historical value and anti-litter messages.

Marine debris clean-ups: the Love our Lakes program has been active in numerous coastline cleanups in collaboration with primary schools, local Aboriginal Land Councils, Sapphire Coast Marine Discovery Centre & Society and government agencies (Figure 25). Projects included a week-long marine debris clean up in May 2012, within Twofold Bay to the northern end of Disaster Bay (City Rock) removing over $4m^3$ of marine debris. The project responded to reports of debris accumulating in these areas from storms and high tides. The project partnered Love our Lakes, Eden Land Council, NSW Fisheries and Bega Valley Shire Council.

Marine debris clean up days have successfully promoted stewardship of our coastlines amongst school children, local industry and community groups. They have also reduced the impact on litter on water quality, fauna and local industries.

Figure 25: Marine debris clean up day at Boydtown Beach conducted by Eden Public School, Love our Lakes and Sapphire Coast Marine Discovery Centre.

Figure 26: Liquid trade waste officer, Tony Jolley discussing Liquid Trade Waste Approvals with Merimbula businessman, Anthony Daly.

Liquid Waste education for businesses: BVSC continued to increase the number of tradewaste connections within the sewered areas of the Shire as well as providing education and support for businesses to meet the treatment requirements of their approvals (Figure 26). This will continue to improve the environmental performance of Council's sewerage treatment plants by improving the quality of effluent discharged to the sewer, thereby reducing the number of chokes and subsequent sewer spillages.

2. Resource consumption

The consumption of resources places an enormous strain on our environment, not only in the manufacturing and provision of resources, but throughout the life-cycle of a product. Pressure on the environment occurs from the quantity of resources consumed to maintain our lifestyle, through to the emissions released in their consumption and to their final disposal.

This section assesses Council's achievement towards the Strategic Priorities *S3: Living Sustainably and A8: Waste Management*, outlined in the Bega Valley Community Strategic Plan (CSP) 2011. The indicators used to measure resource consumption within the BVSC region are outlined in Table 12.

Table 12: Indicators used to measure Council's effectiveness in managing resource consumption within the Bega Valley Shire.

Indicators	Measures	Description
2.1.Energy use	a) Total energy use b) Energy use by sector c) Energy use by fuel type d) Renewable energy use	Assesses effectiveness of initiatives and strategies implemented by Council to increase energy efficiency and use of renewable energies within the Shire.
2.2. Energy efficiency	a) Energy efficiency trends	Assesses effectiveness of promoting and adoption of energy efficiency within the Shire.
2.3. Solid waste generation	a) Total waste generated b) Waste to landfill c) Resource recovery d) Illegal dumping	Assesses effectiveness of initiatives and education to reduce overall waste generation, waste to landfill and illegal dumping.
2.4. Waste management	a) Waste management responses	Actions to reduce total waste stream.
2.5. Greenhouse gas emissions	a) Total GHG emissions b) GHG emissions by source	Measures effectiveness of initiatives and strategies implemented by council to reduce greenhouse gas emissions, and the reductions achieved.

2.1. Energy Use

Assessment

a) Total energy use:

The Council used 5,599,370 kWh of energy at a cost of $1,513,983 in 2011/12 (Figure 27).

Total energy use for 2011/12 was 5.3% greater than 2010/11, but was 7.9% less than 2009/10. This suggests that the total energy use remains fairly stable.

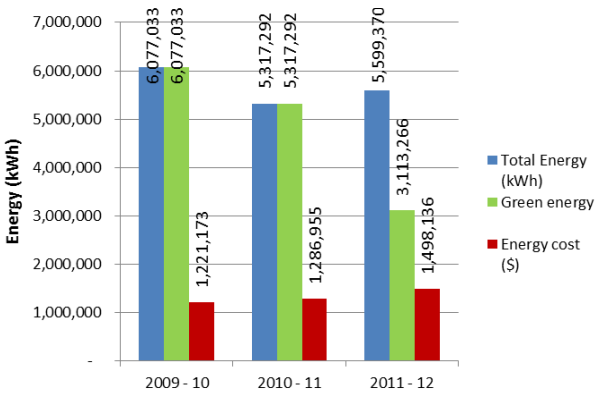


Figure 27: Total energy consumption for Bega Valley Shire Council between 2009 and 2012.

b) Energy use by sector

Sewer and water infrastructure continue to require the greatest amount of energy within Council operations (Figure 28). Water infrastructure has had a significant decline in electricity consumption over the past three reporting periods whereas sewer infrastructure consumption has gradually increased. Streetlights and Council buildings have also had an increase in energy consumption since 2009.

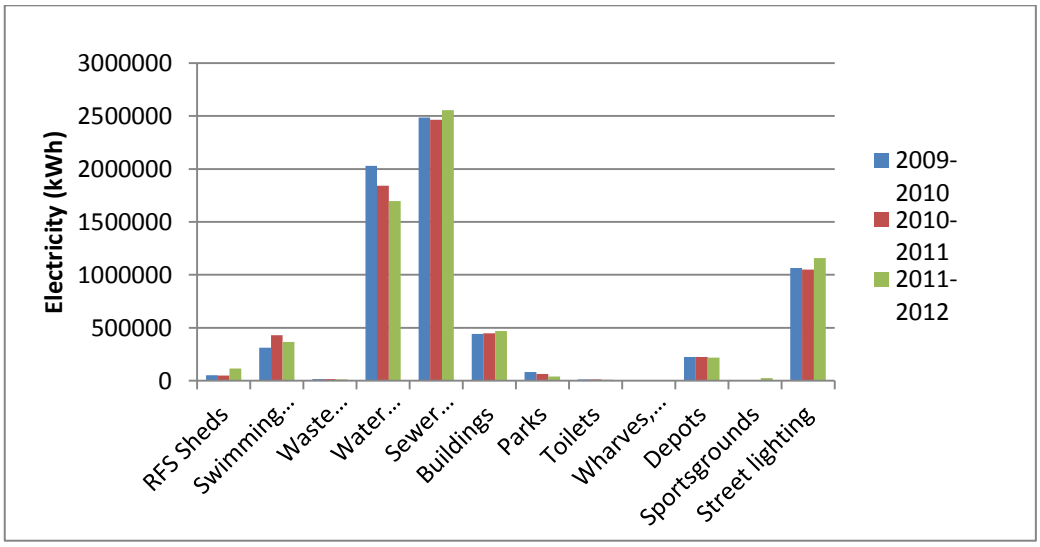


Figure 28: Total energy use by Bega Valley Shire Council by sector between 2009 and 2012.

The increase in energy required to operate sewer infrastructure is directly related to the increase in sewerage volume from higher than average rainfall, requiring more pumping to move the sewerage through the pipes. Similarly, the decrease in energy used to operate water infrastructure was partly due to more rain requiring less pumping to fill the dams and decreasing the overall demand for water.

It is possible that improvements to the air conditioning system in the Council main office may have in part contributed to the increase in energy consumption in the "Council buildings" category. It is unclear why street lighting has had an increased demand for energy as Council does not manage this asset. However, it may be partly due to an increase in streetlights from new housing developments.

c) Energy use by fuel type

In 2011/12, Council used "green power" for half of the period, resulting in a decrease in the energy sourced from renewable sources compared with 2009/10 and 2010/11 (Table 13). When contracting electricity supply in 2006, Council took the opportunity to include green energy into the electricity contracts for all sites. During this contract period which ran till 1st January 2012, all electricity used by the organisation was generated from a renewable

Table 13: Bega Valley Shire Council's energy use by fuel type between 2009 and 2012.

Fuel Type	2009 - 10	2010 - 11	2011 - 12
Renewable energy (kWh)	7,141,046	6,367,720	3,527,284
Coal generated energy (kWh)	-	-	3,231,812
Petroleum products (kL)	1,020	995	1,019
LPG (Gj)	Not collected	Not collected	3

source. Contract changes from 1st January 2012 would have significantly increased the green energy premium and a decision was taken to instead invest this into energy efficiency and renewable energy.

Petroleum use by Council's fleet remains stable (Table 13).

Figure 29: Installation of a grid-connected solar system on Council's Bega Library and Art Gallery in 2011 as part of Council and Essential Energy's Intelligent Network trial.

d) Renewable energy use

Of the total energy consumed by Council during 2011/12, 44.4% or 3,113,266 kWh was green energy (Table 13).

Council is currently involved in a trial with Essential Energy to operate an Intelligent Solar Energy system on the Bega Library (Figure 29). A large battery array stored in a shipping container is charged during the day and released to the network during early evening demand. The Library is benefiting from a portion of the excess solar energy once the batteries are charged. Billing data is yet to be received to see the actual benefits.

Council funds the energy used in Rural Fire Service buildings and Community Halls. A number of these facilities have photovoltaic solar panels which were installed by their own management committees.

Implications: Generally Council's total energy consumption remains stable. Many of the energy efficiency measures have not been in operation long enough to be measured during this reporting period. Council has undertaken rigorous data management of it's energy use over the last two years that will help it to be more targeted in its energy efficiency measures and to measure any savings made. This is discussed further in Section 2.2.

Council's decision to divert funds from the energy provider's green energy and into its own energy efficiency measures has been positive in providing dedicated funding to reduce its energy use. Furthermore, the intention to invest in its own renewable energy will contribute towards enhancing its own energy security and will be an active promotion of renewable energy and support for the community's 50/50 by 20/20 target.

2.2. Energy Efficiency

Assessment: Council enlisted the services of an independent scorekeeper to gather data on electricity use. This simplified the measuring, reporting and monitoring of electricity use. With this data, Council has been better able to identify energy efficiency opportunities and measure the results of efficiency projects. Combined with the efforts of dedicated

staff, there is now a greater organisational understanding of how much energy is consumed and the opportunities to reduce it.

An Energy and Resource Efficiency Fund has been established to identify and support projects which will improve the efficiency of operational activities. Guidelines for the fund have now been approved and initial projects are being scoped.

Council has also joined the NSW Governments Sustainability Advantage Program. As part of this program there were two major sites selected to undergo the Resource Efficiency module. An action plan for the Administration Building and the Eden Sewerage Treatment Plant has been generated. These plans are used in assessing how capital works funds will be allocated as well as measuring the resource use from these and other facilities.

Council is also involved in a street light trial with Essential Energy that uses low energy LED lighting.

Implications: Council has implemented a number of programs and initiatives to reduce its energy consumption. At present the focus is to improve organisational efficiency and reduce the associated energy costs. Council recognises a community target nominated by community group, Clean Energy for Eternity, to reduce energy use by 50% and generate 50% from renewable sources by the year 2020.

BASIX: The BASIX program (Building Sustainability Index) was designed by the NSW Government to assist all new residential developments to comply with government guidelines for sustainability. Under the program, new developments must meet a sustainability score requiring use of water saving devises, thermal properties and energy efficiency. This has contributed to decreased resource consumption within the Shire.

2.3. Solid Waste Generation

Bega Valley Shire Council manages all operational, environmental and administrative matters as they arise at the seven existing waste facilities at Candelo, Cobargo, Bemboka, Wallagoot, Eden, Bermagui and Merimbula. Council is also directly or indirectly involved through contractors, in the collection, handling and disposal of the majority of solid waste generated.

Waste is managed in the Bega Valley Shire through:

- Landfill disposal and resource recovery facilities
- Recycling infrastructure provided by Council such as kerbside bins and recycling drop-off points located at waste transfer stations and landfills
- Reuse opportunities at tip shops located at landfill sites
- Education, community and business programs and partnerships which promote avoidance, reuse and recycling.

Assessment:

a) Total waste generation: The Bega Valley Shire community generated a total of approximately 26,600 tonnes of solid waste in 2011-12. This is a decrease from the previous reporting period where approximately 32,600 tonnes were generated.

b) Waste to landfill: Of this total waste stream approximately 16,130 tonnes was disposed of to Council's landfills, with the remainder recycled. This represents a decline in waste to landfill compared with the previous 3 reporting periods (Table 14). The proportion of landfilled waste by source was 60% municipal, 19% construction and demolition, 11% commercial and industrial and 10% from councils transfer stations.

Municipal waste has declined from previous years, returning to similar levels last seen in 2007/08 (Table 14). The decrease in municipal waste is responsible for the overall decline in total waste to landfill. The construction and demolition sector contributed significantly more tonnes to landfill during 2011/12 compared with previous years, which may be likely to significant developments within the Shire. However, this result may also be likely to a change in waste categorisation between the "commercial and industrial" sector and the "construction and demolition" sector which when combined represent a consistent tonnage with previous years.

Table 14: Tonnes of waste delivered to landfill within the Bega Valley Shire since 2004 to 2012 by sector.

Waste to landfill (tonnes)	2004-05	2005-06	2006-07	2007-08	2009-10	2010-11	2011-12
Commercial & industrial	192.75	8852.6	2557	4180	4152	4099	1819
Construction & demolition	4747	Inc above	1600	1726	1378	2373	3075
Municipal*	1165	5147.4	8812	15766	13976	12946	9719
Waste transferred from other facilities	-	-	-	-	-	2157	1519
Total	**6104.75**	**13,999.6**	**12,969**	**21,672**	**19,505**	**21,575**	**16,132**

(*domestic collection plus private delivery)

In 2011/12, 50% of the kerbside waste collection went to landfill and 50% was recycled, composted or mulched (Table 15).

Table 15: Tonnes of kerbside waste collected in the Bega Valley Shire in 2011/12.

Kerbside Waste Collection (tonnes)	2011/12
Kerbside collected recycling	3972
Kerbside collected organics	2265
Kerbside collected general waste	5958
Litter bin waste collected	179

d) Resource recovery: Council recovers recyclables and organics from waste destined to landfill through reuse opportunities at tip shops, recycling drop-off points at waste transfer stations and landfills, household chemical collection days and kerbside recycling and green waste collection. A total of 6569 tonnes of co-mingled recyclables were diverted

from landfill during 2011/12 which is the highest mass recorded since recycling commenced (Figure 30). Despite this, Council's resource recovery rate as a proportion of the overall waste stream remains fairly consistent with other years at around 40% (Table 16).

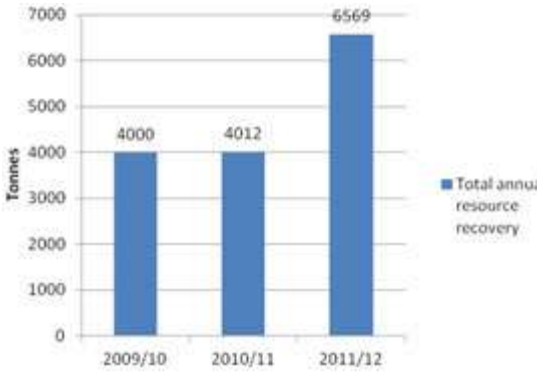


Figure 30: Total annual resource recovery diverted from landfill between 2009 and 2012.

Table 16: Resource recovery at Bega Valley Shire landfills by composition in 2011/12.

Resource Recovery	Merimbula	Eden	Bermagui	Totals
Total self haul organics received/recycled	1600	350	331	2281
Total kerbside organics received recycled	2265			2265
Tyres recycled	11	6	5	22
Wood recycled	56	12	1	69
Mattresses recycled	52	15	13	80
Scrap metal recycled	357			357
Paper / cardboard recycled	289	289	289	867
Co-mingled recycling	343	141	141	625
motor oil recycled	1	1	1	3
Total resource recovery	**4974**	**814**	**781**	**6569**

Overall less waste was collected from the household chemical collection (HCC) scheme in 2011/12 compared with the previous reporting period (Table 17). This is thought to be due to less public coverage, despite the same advertising used as previous years.

Table 17: Toxic chemicals diverted from landfill through Council run household chemical collection (HCC) days.

No.	Waste Type	Pambula	Bermagui	Bega	Pambula	Bermagui	Bega
		Net weight (kg)			Net weight (kg)		
		2010/11			2011/12		
1	Acid	77	9.9	46	6	42.4	24
2	Alkali	22.2	2	33.3	10.3	7.4	17.2
3	Arsenic	1.5	0	1			0.5
4	Asbestos						
5	Automotive products	64	23.5	29	9.2	8.4	36.8
6	Batt - lead acid	1217	939	1074.5	501.6	97.35	970.9
7	Batt – nicad	2.4	3	1.6	0.95	3.4	8.55
8	Batt – Nihyd	1.75	1.75	1.75	1	1.5	4
9	Batt – Normal	19.25	7	16.25	1.3	7.8	27.7
10	Cyanide						
11	Fire Ext – halon		2.5	15.5	4.5		0
12	Fire Ext – other	13	107.1		0	9.2	1.5

No.	Waste Type	Pambula	Bermagui	Bega	Pambula	Bermagui	Bega
		Net weight (kg)			Net weight (kg)		
		2010/11			2011/12		
13	Flares/Ammunition	7.3	2.75	3.7	0		1.5
14	Fluorescent tubes	22.5	1.5	10.5	9.1	8.5	144.9
15	Gas Cylinder - propane	218	215.7	218	25.2	35.125	37.8
16	Gas Cylinder - other		0	1.5	0		1
17	General household chemicals	25.5	31.5	58.5	1.2	29	10.8
18	Halogenated Solvents	3.1	0	2.4	0.4		3.6
19	Heavy Metals	131.25	36.5	6.25	0		8
20	Hydrocarbons and fuels	233.04	60.69	58.26	77.65	29.86	77.65
21	Inert liquids						
22	Inert solid	78	76.8	249	2.6	23.2	23.4
23	Smoke detectors	7.2	0.5	1.8	0		1
24	Oil (>61°C)	797.71	372.87	906.49	405.58	61.245	563.32
25	Organoperoxides	1	0.25		0.5		0
26	Oxidising agents	7.5	2.25	4	0	3.4	0.5
27	Paint - water	1764.87	272.96	675.23	305.4	322.75	1034.6
28	Paint – Oil	1015.75	602.55	667.05	138.35	426.8	726.65
29	Paint – metal		10.5	5	0	3.4	3.5
30	Paint – other	6.65		2.85	0.3		1.2
31	PCB material						
32	Pesticide - general liquid	42.75	17.55	214.05	55.04	92.55	37.76
33	Pesticide - general solid	23.4	10	50.6	5.2	10.8	7.8
34	Pesticide - organochlorine liquid	12.5	0	15.5	0	1.8	9.5
35	Pesticide - organochlorine solid			1.5			
36	Reactives	0.5	0.5	63.5	4.5	0.25	0
37	Toxics	18.8	19.2	28.2	11.6	11.8	17.4
38	Pharmaceuticals	19.4	5.5	15.6	1	4.8	0
39	Photographic chemicals	60	6.6		5.3	5.6	47.7
40	Unknown Liquid	47.15	137.58	137.95	107.58	42.78	71.72
41	Unknown Solid	1.2	0	4.8	6		0
42	Aerosols	26.75	22	47.25	16.1	8.35	21.9
	TOTAL	**5989.92**	**3002**	**4668.38**	**1713.45**	**1299.46**	**3944.35**
	NET TOTAL	**13.660 tonnes**			**6.957 tonnes**		

d) Illegal Dumping:

Assessment: There were 35 reports of illegal dumping during 2011/12, but it is considered that the data represents a large level of under-reporting (Table 18). This is partly due to a change in Council's customer request software and also that the system of reporting is still being developed. Unfortunately trends in illegal dumping are not able to be drawn due to a lack of data collection between 2004 and 2009. However, anecdotally illegal dumping continues to be an issue across the Shire. Data regarding illegal dumping for comparison purposes should be obtained from Council's 2000 and 2004 comprehensive SoER's and was collected as estimated tonnes.

Table 18: Number of reports of illegal dumping within the BVSC region from 2001/02 to 2011/12.

Type	2010/11	2011/12
Cars	11	3
House Hold rubbish	19	10
Mattresses	6	3
Garden organics	2	4
Tyres	1	1
Furniture	2	2
Electrical goods / white goods	3	3
Asbestos	0	2
Demolition material / fill	0	3
Offal / effluent	1	1
Total	**45**	**34**

Note. Data regarding illegal dumping in the Bega Valley Shire was not collected between 2004 and 2009.

Council provided assistance to reduce impacts from illegal dumping through in kind support in the form of free tipping to Local Area Land Councils (LALC) to undertake clean-up of illegally dumped waste on aboriginal land in Bournda and to the annual Clean-up Australia Day program.

Figure 31: Illegal dumping near Cobargo tip 28/10/2012.

Implications: Generally, the measures for solid waste management indicate that Council has effectively managed the Shires waste and is progressing its Strategic Priorities *S3: Living Sustainably and A8: Waste Management*, outlined in the Council's Community Strategic Plan 2012. Overall, waste entering landfill was reduced during 2011/12 while resources recovered for recycling was the greatest mass recorded since recycling commenced. Furthermore, despite lower than average mass in 2011/12, the household chemical collection (HCC) scheme continued to be successful in diverting harmful chemicals from potentially entering landfill as well as providing a convenient disposal opportunity for the community.

Currently the three landfills in the Bega Valley Shire are now reaching their capacity and a new central waste facility (CWF) at Wanatta Lane, Frog's Hollow, will be opened in 2013-2014. The CWF will comply with modern environmental guidelines and have a weigh station which will allow more accurate measurement of the Shire's waste stream. This will

assist SoE evaluation on the effectiveness of Council's management for waste minimisation.

Improved management of illegal dumping is required as it continues in the Bega Valley Shire and is likely to have an environmental impact. However, this impact is difficult to quantify due to the lack of reliable data on the incidence, location and type of materials being dumped. Efforts to rectify this situation are underway with involvement with the NSW EPA Regional Illegal Dumping program and the Southern Council's Group. The NSW EPA have funded the development of a draft illegal dumping plan for the Bega Valley Shire and this is likely to be received and implemented during the next reporting period. A key element of the plan is likely to be an improved data collection and reporting system so that illegal dumping can be better controlled and regulated and so that hotspots can be targeted and education programs more specifically designed.

2.4. Waste Management

Assessment: Council is progressing its 2020 Vision on Waste Strategy (2001) through implementation of programs and initiatives to improve waste management and reduce waste to landfill.

Waste education and minimisation officer: was employed at Council in 2011 to promote methods for the community to reduce its waste to landfill through the principals of avoid, reduce, reuse and recycle.

Tip shops: are located at the three landfills (Figure 32). These divert useable items from going to landfill and are sold to the community at a nominal cost. Tip shops further encourage recycling by offering free disposal for most items that are able to be reused.

Kerbside recycling services expansion: to an additional 1900 households in rural areas, taking the total number of households serviced with both general waste and recycling to over 15,000.

Love Food Hate Waste Program: the Council won a government grant funding of $22k to implement the NSW Government's Love Food Hate Waste program. It will involve workshops and demonstrations at all of the major markets and festivals around the Shire, helping residents to reduce food waste at home

Figure 32: Tip shop (above) and white good recycling (below) at Merimbula landfill

Figure 33: Work underway on the access road in the new Wanatta Lane Central Waste Facility

Wanatta Lane Central Waste Facility: Council achieved development consent for its central waste facility, a best practice engineered facility designed to replace Council's three small landfills which are at capacity.

Reduce, Reuse and Recycle Workshops: are regular workshops conducted by Council around the themes of Reduce, Reuse and Recycle. Topics included hot composting, rag-rug making and making mosaics from broken crockery.

Bermagui Pre-school Tip Excursion: taught the principals of reduce, reuse and recycle. Discarded items were collected and taken back to the pre-school where they were made into a 'car' for the children to play on in the yard.

Bega High School permaculture garden: is aimed at providing an alternative to the classroom for at-risk students. Council assisted with infrastructure, equipment and training for the establishment of a series of worm farms on the site.

Primary Schools Recycle Art Program: involved over 500 students from 12 schools across the shire, making sea creatures from recycled materials which have been displayed a different events throughout the Shire (Figure 34).

Bega Valley Swapsies: Council has collaborated with Bega Valley Swapsies to organise clothes swaps as a form of recycling and community building.

Figure 34: Council's Primary Schools Recycled Art Program 2012. (left) Emerson Sirl, Kitty Roche and Cassidy Marshall of the Sapphire Coast Anglican College, (right) Emily Love and Matilda Wainwright of Towamba Public School.

2.5 Greenhouse gas emissions

Assessment

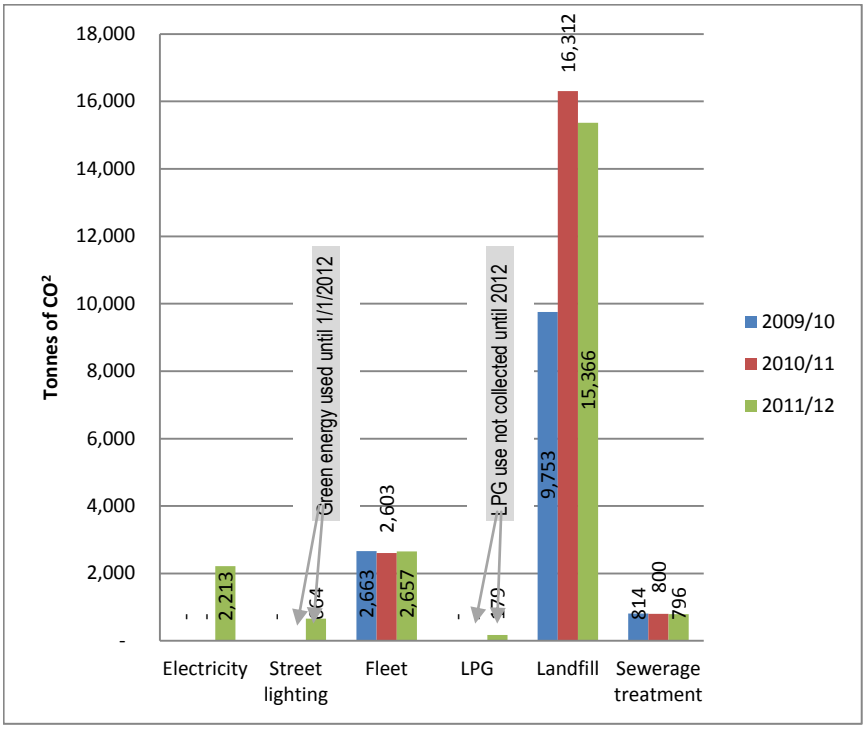


Figure 35: Bega Valley Shire Council's greenhouse gas emissions in carbon equivalent by sector for the last three financial year periods.

a) Total greenhouse gas (GHG) emissions: The total GHG emissons for 2011 – 2012 was 21,696 tonne of carbon dioxide equivalent (CO2-e) (Table 19). Coucil paid a green energy premium to our energy provider until 1/1/2012. This offset all GHG emissions from electricity or streetlighting until this date. Council now redirects the savings from discontinuing paying the green energy premium into energy effeciency and renewable energy systems.

b) GHG emissions by fuel source: Landfill is Council's greatest contributor of GHG emissions (Figure 35). There has been a gradual decline in GHG emissions from the treatment of sewerage.

Table 19: Bega Valley Shire Council total GHG emissions between 2009 and 2012.

Emissions in tonnes of CO2-e	2009/10	2010/11	2011/12
Total CO2-e	13,230	19,715	21,874

Implications: Council's GHG emissions increased in 2011/12 due to the discontinuation of its green energy contract with its energy provider which offset Council's emissions for electricity consumption. However, there will be a long term benefit through the provision of dedicated funding to improve Council's energy efficiency.

It is important that waste to landfill continues to decrease per capita as the population increases to ensure that GHG emissions are not increased. Resource recovery strategies have proven successful in diverting waste from landfill and will require continued efforts in to prevent GHG emissions from landfill triggering thresholds requiring reporting to Federal Government.

3. Climate Change Adaption

Council recognises the science and government position on climate change. In developing adaption strategies and plans to accommodate the potential effects of climate change on land use, services and infrastructure, Council will be guided by science, government policy and direction, and the directives of its insurance brokers.

This section assesses Council's achievement towards the Strategic Priorities *S6: Climate Change*, outlined in the Bega Valley Community Strategic Plan (CSP) 2011. The indicators used to measure Council's preparedness for adapting to Climate Change are outlined in Table 20.

Table 20: Indicators to measure Council's preparedness for adapting to Climate Change

Indicator	Measures	Description
3.1 Climate preparedness and adaptation resources.	a) Actions to assess climate change risks, impacts and opportunities. b) Actions to incorporate climate variability into Council's strategic planning and management responses.	Measures Council's preparedness for management under Climate Change.

3.1 Climate preparedness and adaptation responses

Assessment:

a) Actions to assess climate change risks, impacts and opportunities: Council commissioned a Climate Change Risk Assessment in 2010 across all sections of Council, as part of its obligation to its Insurance brokers (Echelon, 2010). The assessment prioritised a list of actions to mitigate risk focusing on planning policy, public liability and bushfire risk.

Council adopted a position on Climate Change in the CSP 2011. This commits Council's strategic planning to adapt services and infrastructure to mitigate the potential effects of climate change on settlement and infrastructure in the Shire.

A Climate Change Policy and Strategy were drafted in 2010 and was being revised with consideration of new research, guidelines and Council's CSP at the time of reporting. These are intended to be submitted to Council for adoption within the next reporting period.

Council participated in the NSW government *South-east Regional Climate Change Vulnerability Assessment* in 2011/12 which will provide a regional approach for managing predicted climate change impacts. The report was not available at the time of reporting.

Council invested in high resolution LIDAR imagery of the Shire's coastline, which provides the detail important for modelling predicted sea-level rises, and assessing risk to towns and infrastructure.

b) Actions to incorporate climate variability into Council's strategic planning and management responses: The priority actions outlined in the Climate Change Risk

Assessment (2010) have been incorporated into a number of Council's plans and strategies. Asset management plans prioritise infrastructure to be relocated to locations of less risk from natural forces associated with climate change as they reach their end of use.

Risks identified in the above assessment were incorporated into the draft Comprehensive Local Environment Plan (CLEP) 2012. Buffers around estuaries were increased and surrounding lands zoned appropriately to reduce risk from predicted impacts from climate change. Furthermore, sea-level rises released by the former Department of Environment, Climate Change & Water (DECCW, 2009) now currently OEH, were incorporated into Clause 6.6 - Coastal Hazards.

Risks from bushfire identified in the Climate Change Risk Assessment (2010), have been incorporated into Council's Asset Protection (APZ) program for Council managed bushlands and reserves.

Implications: The Bega Valley Shire Council has been proactive in incorporating climate change adaption measures into its planning and management. However, the tools from which to guide adaptation responses and priorities have been lacking and priority has not been given to the development and adoption of the Climate Change Policy or Strategy within the reporting period. Despite this, all new planning instruments include measures for climate change adaption, placing the Council is a good position for climate change preparedness. There is scope, however, to vastly improve Council's preparedness as our outlined in the recommendations in Section 3.3.

4. Land resources

Baseline data regarding land degradation issues in the Bega Valley Shire is best sourced from the 2004, 2008 and 2009 SoER's. Land is needed to sustainably support a range of landuses such as agriculture, urban development, and waste disposal or transport infrastructure. For this reason, land quality, or the extent to which the soil resource is free from depletion or degradation, is important.

Defining a meaningful indicator to reflect the impact of land degradation is difficult. Ideally, land quality would be assessed on the basis of fundamental soil properties which reflect the condition of the soil; however this is not possible in the Bega Valley Shire. Factors such as the extent of erosion and erodible soils, land contamination and acid sulphate soil presence are though generally able to be considered in determining impact on land quality.

Erosion and sedimentation can be of equal concern to rural and urban areas due to the threat to road and building infrastructure. Further problems arise from rivers and lakes silting up as a result of sediment washed off construction sites and stream banks, and the generation of dust from soils that have had their surface structure destroyed.

As redevelopment pressures grow in the Shire previous land uses that may have the potential to contaminate the land may become relevant. Contamination information needs to be managed and when land is being redeveloped site history for potential contamination needs to be assessed.

Similarly development of low lying areas in coastal shires like the Bega Valley may involve potential acid sulphate soils and this also needs careful assessment to protect land (and water) quality.

This section assesses Council's achievement towards the Strategic Priority: *S7: Health of natural systems*, outlined in the Bega Valley Community Strategic Plan (CSP) 2011. The indicators used to assess the state of our land resources are outlined in Table 21.

Table 21: Indicators used to assess the state of our land resources.

Indicator	Measures	Description
4.1 Land degradation	a) Area & location of land impacted by salinity, acidity, erosion and structural decline. b) Contaminated sites. c) Area of productive land and agricultural productivity rates.	Measures the appropriateness of land management with regards to maintaining its agricultural productivity. Assesses management in reducing number, severity and extent of contaminated sites.
4.2 Land Management Responses	a) Land management responses.	Actions to improve land management.

4.1 Land degradation

Assessment:

a) Area & location of land impacted by salinity, acidity, erosion and structural decline: Sedimentation and erosion continues to be a serious environmental problem in

the Shire. Soil and sediment washed from disturbed sites is a problem because it contains nutrients and organic materials that can impact upon the Shire's fragile coastal ecosystems. Although complaints regarding erosion and soil loss are still not able to reported in Council's systems, anecdotally the number of complaints received has grown. Soil erosion from development sites is a major source of sediment pollution in Shire drains and waterways (Figure 36).

Figure 36: (left) example of no sediment fences; (middle and right) examples of poorly maintained sediment fences.

Acid sulphate soil potential impacts remain unchanged from previous reports.

b) Contaminated sites: Land contamination remains relatively unchanged since the 2008 report. Land contamination issues are dealt in accordance with the legislation on merit as development or redevelopment proposals are assessed and determined. Contamination issues associated with the Ex Mobil tank farm site in Eden remain incomplete as have the issues regarding the ELGAS (ex Bega Gasworks site in Bega) though staff liaison with the EPA Contaminated Sites branch continues.

Greater emphasis has been afforded existing and ex service station sites due to the introduction of the underground petroleum storage (UPSS) requirements in the Protection of the Environment Operations Act, (POEO) 1997. The UPSS Regulation was amended in November 2011 to extend the EPA's role as appropriate regulatory authority for implementing the Regulation for another five years to June 2017. It is anticipated local government will resume broader regulatory roles under the Regulation after this date.

Figure 37: (left) excavation for contamination sampling at Merimbula Airport; (middle) Remediation of former Merimbula petroleum station; (right) remediation of former North Bega petroleum station.

Underground petroleum storage systems (UPSS) have the potential to leak, leading to expensive clean-up bills and damage to the environment. Persistent leaks can have a major impact on neighbouring properties and impose very significant costs on the tank owner and the broader community. Council staff continue to liaise with EPA regarding UPSS sites.

Implications: The implications of sedimentation and erosion, land contamination and acid sulphate soils remain of concern. Changes since the 2004 and 2008 / 2009 SoE reports have not been substantial.

Council's Soil and Water Management Policy has been reviewed and Guidelines drafted.

Land contamination over the 12 months of this reporting period has been managed in accordance with legislation. Remediation of some sites has also been managed including service station sites at North Bega, Bega, Merimbula and Pambula.

4.2 Land Management Responses

Healthy Soils Healthy Farms is a four (4) year project started in 2009 and administered by the Far South Coast Landcare Association. The project will look at ways of improving soil health and the potential to increase the amount of carbon that can be stored in the soil. Two trial sites, one at Haxstead in the Eurobodalla and one at Brianderry in the Bega Valley, will use a range of biological fertilisers, conventional fertilisers, grazing management and wide-spaced trees to see if one or a combination of approaches will improve soil health, in turn leading to greater fodder production and increased farm productivity. Results from these trials will be available in the next reporting period.

During the reporting period the focus of the BVSC Weeds Section was expanded creating a holistic vegetation management unit capable of undertaking and supporting a range of vegetation management projects from revegetation and restoration to weed control and eradication. This change has seen the implementation of strategic revegetation projects that complement works by other agencies and community groups such as the revegetation works between the Bega River and Bega Township. These works promote the establishment of groundcover and protect erosion of drainage lines.

Other projects that provide benefits in terms of increasing siol health and reducing soil erosion within the Shire include the Bega Cheese Environmental Management Systems, Bega River Riparian Management Program and the Pambula River rehabilitation program discussed in detail in section *1.8. Riparian Vegetation.*

5. Biodiversity (including Vegetation) Management

Bega Valley Shire is rich in biodiversity. Three quarters of the Bega Valley Shire is National Park, State Forest or public reserve. NSW Government agencies share responsibility with Council for managing the vegetation and biodiversity in these areas.

This section assesses Council's achievement towards the Strategic Priorities: *S1: Natural environment protected and S7: Health of natural systems*, outlined in the Bega Valley Community Strategic Plan (CSP) 2011. The indicators used to measure the effectiveness of Council's management in maintaining our rich biodiversity are outlined in Table 22.

Table 22: Indicators used to assess Council's management for maintaining our rich biodiversity.

Indicator	Measures	Description
5.1 Native Species	a) Number of threatened species by status. b) Key threatening processes (inc. specifically from production and major activities within the Shire).	Measures change in number and status of listed threatened species to assess the effectiveness of Council's management to reduce threatening processes especially from land production.
5.2 Vegetation extent	a) Area and type of vegetation.	Measures changes in the extent and type of vegetation and outlines any significant trends cause and impacts for this trend.
5.3 Pest plant control	a) Extent of pest plant infestations. b) Identify pest plants causing threatening processes. c) Actions to reduce pest plants.	Measures the effectiveness of Council's management of pest plants. Reports on the issues pest plants pose in threatening native species and ecological communities considered to be at risk.
5.4 Pest animal control	a) Extent of pest animal infestations. b) Identify pest animals causing threatening processes. c) Actions to reduce pest animals.	Measures the effectiveness of Council's management of pest animals. Reports on the issues pest animals pose in threatening native species and ecological communities considered to be at risk.
5.5 Fire management	a) Area of land affected by fires by fire frequency and intensity of burn and by type of plants and animals affected. b) Outline Council's fire management strategies, guidelines and bushfire risk management plans.	Measures the extent, frequency, intensity and impact of fire events within the Shire. Discusses the impacts and potential impacts of fire events on native species, threatened species and fire sensitive species within the Shire and how management can mitigate these impacts.
5.6 Conservation management responses	a) Biodiversity conservation measures.	Actions and policies to conserve biodiversity.

Habitat removal, disturbance and fragmentation through vegetation clearing and/or modification are major threats to native species and ecosystems in the Shire area. Population increases (and the resulting demand for urban development) within the Shire puts pressure on native species and communities, particularly in lowland and coastal areas. Disturbances such as urban development, habitat fragmentation, fires and drought may lead to further degradation or loss of ecological communities.

Invasive plants and animals exert further pressure on ecological communities and species. The Bega Valley Shire contains endangered ecological communities and threatened or endangered plant and animal species. Council and the NSW Government

have responsibility for protecting and managing threatened plant and animal species and their habitats on private lands and aim to identify remaining corridors that provide linkages between larger protected areas.

Private lands in the coastal zone retain the most significant remnant vegetation and habitat outside of reserved areas. The greatest pressures on these areas are from clearing for new development and bushfire hazard management, illustrating the bushland/ reserve interface. Illegal vegetation removal and fire hazard management are ongoing challenges. Council also has responsibility for weed species management to reduce impacts on agricultural production, natural ecosystems and the overall environmental value of Bega Valley Shire.

5.1 Native Species

a) Number of threatened species by status.

Table 23: Native species recorded within the Shire

Species grouping	Number of species	
	Atlas of Living Australia[1]	Bionet[1]
all species	5617	2795
Animals	2550	499
Mammals	89	98
Birds	394	323
Reptiles	52	44
Amphibians	33	29
Fish	367	0
Molluscs	325	0
Arthropods	1058	0
Crustaceans	210	0
Insects	772	1
Plants	2534	2296
Fungi	319	0
Chromista	37	0
Protozoa	3	0
Bacteria	4	0
Algae	134	0

[1] Search of BVSC LGA includes marine and exotic species and historic records
[1] Search of BVSC LGA exotic species removed, includes marine species and historic records

The number of species recorded within the Shire varies according to the data base used to source this information. For example the Atlas of Living Australia contains records of 5617 species within the Bega Valley Shire Local Government Area while the NSW Office of Environment and Heritage's (OEH) Bionet database indicates 2795 species have been recorded. These differences reflect the use of different data sources, notably the inclusion of several additional data bases in the Atlas of Living Australia data set, along with the ability of members of the public to record sightings directly onto the Atlas of Living Australia. Whichever data set is used, it is clear that the Shire supports a highly diverse range of species. This diversity reflects the habitat diversity, from coastal areas and lowland plains to the escarpment, along with the large areas of native vegetation cover found in the Shire. A summary of the number of species recorded within the Shire is found in Table 23.

As with previous SoE reports the understanding of the diversity of life within the Shire is hampered by a lack of data for particular faunal groups, especially invertebrates. For the better known groups such as birds and mammals there is little data available to assess the change in abundance of these species. Current projects and opportunities of future data collection promise to

provide data that will allow the status of some of the common fauna throughout the Shire to be evaluated.

Opportunities exist to utilise the Far South Coast Birdwatchers group to monitor the state of common birds within the Shire. The Far South Coast Birdwatchers are a community group that organises field trips and collects data on local bird numbers and diversity, passing this information on to the BirdLife Australia data base Birddata. Setting up permanent monitoring sites in key areas within the shire would provide a cost effective method of collecting data on the status of common bird species. BVSC is currently discussing this opportunity with the group.

Knowledge of the diversity of species occurring within the Bermagui area was boosted during the reporting period via a Bioblitz organised by Libby Hepburn, founder of the Atlas of Life in the Coastal Wilderness project and supported by Auswide Projects, Bega Valley Shire Council, Atlas of Living Australia, Australian Museum, CSIRO Discovery, NSW National Parks and Wildlife Service, Bournda Environmental Education Centre. The aim of the Bioblitz was to give schools and community the opportunity to participate in genuine scientific surveys and to discover and celebrate the diversity of life in and around the township of Bermagui. Over the 30 hours of survey nearly 300 people participated in 42 surveys and recorded over 500 species. Following the success of this project there are plans for future bioblitz's within the Shire.

Other projects that will provide valuable data on the state of native species within the Shire are discussed in Section 5.6.

Threatened species

A total of 40 plant, 26 mammal, 52 bird, five amphibians and one invertebrate species found in the Shire are listed as threatened or endangered under the Threatened Species Act 1994 (TSC Act) and/or the Environmental Protection and Biodiversity Conservation Act 1999 (Table 24 and Table 25). A further 31 species of bird are listed a migratory under the EPBC Act. Species listed under these Acts are listed in Table 24 and Table 25. There are fourteen (14) Endangered Ecological Communities (EECs) listed under State and Federal legislation known to occur within the Shire. The extent of these communities is included in Table 28 in Section 5.2. The number of threatened species found within the Shire does not differ significantly from previous SoE reports, with any differences attributable to the organisation of the data rather than from any status changes in the species themselves.

A key development in terms of threatened species management during the reporting period was the federal listing of Koala populations in Queensland, New South Wales and the Australian Capital Territory under the *Environmental Protection and Biodiversity Conservation Act 1999*. This listing has local implications for the small population of Koalas existing in the Biamanga area. The size and geographical extent of this population is the focus of a study currently underway by NPWS.

Table 24: Listed threatened fauna species within the Shire

Scientific Name	Common Name	NSW status	Comm. status	Bionet Records
Mammals				
Arctocephalus pusillus doriferus	Australian Fur-seal	V,P		17
Phascogale tapoatafa	Brush-tailed Phascogale	V,P		14
Petrogale penicillata	Brush-tailed Rock-wallaby	E1,P	V	3
Dugong dugon	Dugong	E1,P		1
Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	V,P		124
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V,P		104
Mormopterus norfolkensis	Eastern Freetail-bat	V,P		12
Cercartetus nanus	Eastern Pygmy-possum	V,P		59
Kerivoula papuensis	Golden-tipped Bat	V,P		7
Scoteanax rueppellii	Greater Broad-nosed Bat	V,P		23
Pteropus poliocephalus	Grey-headed Flying-fox	V,P	V	76
Megaptera novaeangliae	Humpback Whale	V,P	V	9
Phascolarctos cinereus	Koala	V,P	V	838
Potorous longipes	Long-footed Potoroo	E1,P	E	66
Potorous tridactylus	Long-nosed Potoroo	V,P	V	276
Arctocephalus forsteri	New Zealand Fur-seal	V,P		2
Pseudomys fumeus	Smoky Mouse	E4A,P	E	110
Isoodon obesulus obesulus	Southern Brown Bandicoot (eastern)	E1,P	E	122
Myotis macropus	Southern Myotis	V,P		41
Eubalaena australis	Southern Right Whale	E1,P	E	2
Physeter macrocephalus	Sperm Whale	V,P		1
Dasyurus maculatus	Spotted-tailed Quoll	V,P	E	129
Petaurus norfolcensis	Squirrel Glider	V,P		2
Sminthopsis leucopus	White-footed Dunnart	V,P		53
Petaurus australis	Yellow-bellied Glider	V,P		1903
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V,P		2
Birds				
Stercorarius parasiticus	Arctic Jaeger	P	J,K	4
Botaurus poiciloptilus	Australasian Bittern	E1,P	E	5
Rostratula australis	Australian Painted Snipe	E1,P	V	1
Ninox connivens	Barking Owl	V,P,3		33
Limosa lapponica	Bar-tailed Godwit	P	C,J,K	23
Ixobrychus flavicollis	Black Bittern	V,P		3
Thalassarche melanophris	Black-browed Albatross	V,P	V	8
Limosa limosa	Black-tailed Godwit	V,P	C,J,K	1
Pterodroma nigripennis	Black-winged Petrel	V,P		1
Oxyura australis	Blue-billed Duck	V,P		2
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V,P		10
Burhinus grallarius	Bush Stone-curlew	E1,P		1

Scientific Name	Common Name	NSW status	Comm. status	Bionet Records
Hydroprogne caspia	Caspian Tern	P	C,J	53
Ardea ibis	Cattle Egret	P	C,J	16
Irediparra gallinacea	Comb-crested Jacana	V,P		2
Tringa nebularia	Common Greenshank	P	C,J,K	17
Tringa totanus	Common Redshank	P	C,K	1
Actitis hypoleucos	Common Sandpiper	P	C,J,K	4
Sterna hirundo	Common Tern	P	C,J,K	12
Calidris ferruginea	Curlew Sandpiper	E1,P	C,J,K	11
Stagonopleura guttata	Diamond Firetail	V,P		20
Dasyornis brachypterus	Eastern Bristlebird	E1,P	E	266
Numenius madagascariensis	Eastern Curlew	P	C,J,K	37
Pezoporus wallicus wallicus	Eastern Ground Parrot	V,P,3		465
Pandion cristatus	Eastern Osprey	V,P		18
Egretta sacra	Eastern Reef Egret	P	C	24
Petroica phoenicea	Flame Robin	V,P		230
Ardenna carneipes	Flesh-footed Shearwater	V,P	J,K	1
Apus pacificus	Fork-tailed Swift	P	C,J,K	13
Callocephalon fimbriatum	Gang-gang Cockatoo	V,P,3		570
Diomedea gibsoni	Gibson's Albatross	V,P	V	1
Calyptorhynchus lathami	Glossy Black-Cockatoo	V,P,2		905
Plegadis falcinellus	Glossy Ibis	P	C	3
Falco hypoleucos	Grey Falcon	E1,P,2		1
Pluvialis squatarola	Grey Plover	P	C,J,K	4
Tringa brevipes	Grey-tailed Tattler	P	C,J,K	5
Thinornis rubricollis	Hooded Plover	E4A,P		147
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	V,P		9
Gallinago hardwickii	Latham's Snipe	P	C,J,K	22
Charadrius mongolus	Lesser Sand-plover	V,P	C,J,K	1
Numenius minutus	Little Curlew	P	C,J,K	3
Hieraaetus morphnoides	Little Eagle	V,P		38
Glossopsitta pusilla	Little Lorikeet	V,P		54
Sternula albifrons	Little Tern	E1,P	C,J,K	254
Anseranas semipalmata	Magpie Goose	V,P		1
Tringa stagnatilis	Marsh Sandpiper	P	C,J,K	2
Tyto novaehollandiae	Masked Owl	V,P,3		195
Macronectes halli	Northern Giant-Petrel	V,P	V	1
Pachycephala olivacea	Olive Whistler	V,P		73
Pluvialis fulva	Pacific Golden Plover	P	C,J,K	2
Haematopus longirostris	Pied Oystercatcher	E1,P		288
Petroica rodinogaster	Pink Robin	V,P		9
Stercorarius pomarinus	Pomarine Jaeger	P	C,J	1
Ninox strenua	Powerful Owl	V,P,3		909

Scientific Name	Common Name	NSW status	Comm. status	Bionet Records
Pterodroma solandri	Providence Petrel	V,P	J	3
Merops ornatus	Rainbow Bee-eater	P	J	1
Calidris canutus	Red Knot	P	C,J,K	3
Calidris ruficollis	Red-necked Stint	P	C,J,K	18
Anthochaera phrygia	Regent Honeyeater	E4A,P	E	7
Arenaria interpres	Ruddy Turnstone	P	C,J,K	5
Calidris alba	Sanderling	V,P	C,J,K	5
Petroica boodang	Scarlet Robin	V,P		289
Calidris acuminata	Sharp-tailed Sandpiper	P	C,J,K	14
Ardenna tenuirostris	Short-tailed Shearwater	P	J,K	33
Thalassarche cauta	Shy Albatross	V,P	V	7
Tyto tenebricosa	Sooty Owl	V,P,3		303
Haematopus fuliginosus	Sooty Oystercatcher	V,P		72
Ardenna grisea	Sooty Shearwater	P	C,J	3
Chthonicola sagittata	Speckled Warbler	V,P		1
Circus assimilis	Spotted Harrier	V,P		2
Lophoictinia isura	Square-tailed Kite	V,P,3		22
Calamanthus fuliginosus	Striated Fieldwren	E1,P		115
Ptilinopus superbus	Superb Fruit-Dove	V,P		1
Lathamus discolor	Swift Parrot	E1,P,3	E	32
Neophema pulchella	Turquoise Parrot	V,P,3		5
Daphoenositta chrysoptera	Varied Sittella	V,P		118
Diomedea exulans	Wandering Albatross	E1,P	E,J	4
Ardenna pacificus	Wedge-tailed Shearwater	P	J	10
Numenius phaeopus	Whimbrel	P	C,J,K	14
Haliaeetus leucogaster	White-bellied Sea-Eagle	P	C	317
Epthianura albifrons	White-fronted Chat	V,P		49
Hirundapus caudacutus	White-throated Needletail	P	C,J,K	122
Chlidonias leucopterus	White-winged Black Tern	P	C,J,K	1
Amphibians				
Mixophyes iteratus	Giant Barred Frog	E1,P,2	E	1
Heleioporus australiacus	Giant Burrowing Frog	V,P	V	48
Litoria aurea	Green and Golden Bell Frog	E1,P	V	25
Litoria littlejohni	Littlejohn's Tree Frog	V,P	V	3
Mixophyes balbus	Stuttering Frog	E1,P,2	V	14
Invertebrates				
Petalura gigantea	Giant Dragonfly	E1		1

Table 25 Listed threatened flora species within the Shire

Scientific Name	Common Name	NSW status	Comm. status	Records
Acacia constablei	Narrabarba Wattle	V,P	V	34
Acacia georgensis	Bega Wattle	V,P	V	77

Scientific Name	Common Name	NSW status	Comm. status	Records
Astrotricha crassifolia	Thick-leaf Star-hair	V,P	V	1
Astrotricha sp. Wallagaraugh	Merimbula Star-hair	E1,P		31
Boronia deanei	Deane's Boronia	V,P	V	7
Calotis glandulosa	Mauve Burr-daisy	V,P	V	2
Correa baeuerlenii	Chef's Cap Correa	V,P	V	158
Cryptostylis hunteriana	Leafless Tongue Orchid	V,P,2	V	1
Dampiera fusca	Kydra Dampiera	E1,P		3
Distichlis distichophylla	Australian Saltgrass	E1,P		14
Diuris ochroma	Pale Golden Moths	E1,P,2	V	1
Eucalyptus imlayensis	Imlay Mallee	E4A,P,3	E	13
Eucalyptus parvula	Small-leaved Gum	E1,P	V	6
Galium australe	Tangled Bedstraw	E1,P		3
Genoplesium rhyoliticum	Rhyolite Midge Orchid	E1,P,2	E	13
Grevillea acanthifolia subsp. paludosa	Bog Grevillea	E1,P	E	4
Haloragis exalata subsp. exalata	Square Raspwort	V,P	V	4
Leionema ralstonii	Ralston's Leionema	V,P	V	116
Lysimachia vulgaris var. davurica	Yellow Loosestrife	E1,P,3		4
Monotaxis macrophylla	Large-leafed Monotaxis	E1,P		3
Monotoca rotundifolia	Trailing Monotoca	E1,P		1
Nematolepis rhytidophylla	Nalbaugh Nematolepis	V,P	V	12
Persicaria elatior	Tall Knotweed	V,P	V	2
Pomaderris bodalla	Bodalla Pomaderris	V,P		13
Pomaderris cotoneaster	Cotoneaster Pomaderris	E1,P	E	8
Pomaderris elachophylla	Lacy Pomaderris	E1,P		10
Pomaderris parrisiae	Parris' Pomaderris	V,P	V	32
Pseudanthus ovalifolius	Oval-leafed Pseudanthus	E1,P		1
Pultenaea pedunculata	Matted Bush-pea	E1,P		13
Senecio spathulatus	Coast Groundsel	E1,P		1
Thesium australe	Austral Toadflax	V,P	V	7
Viola cleistogamoides	Hidden Violet	E1,P,3		22
Wahlenbergia scopulicola	Rock-face Bluebell	E1,P		7
Westringia davidii	David's Westingia	V,P	V	32
Wilsonia backhousei	Narrow-leafed Wilsonia	V,P		25
Xerochrysum palustre	Swamp Everlasting	P	V	5
Zieria buxijugum	Box Range Zieria	E4A,P,2	E	6
Zieria formosa	Shapely Zieria	E4A,P,2	E	12
Zieria parrisiae	Parris' Zieria	E4A,P,2	E	7
Zieria tuberculata	Warty Zieria	V,P	V	1

Assessment: As with the more common fauna within the Shire there is a general lack of monitoring and associated data available to report on the status of threatened species. One exception is the monitoring of threatened shore birds.

Table 26: Results of shorebird monitoring between 2010 and 2012.

	2010-2011		2011-2012	
Species	**Breeding pairs**	**fledglings**	**Breeding pairs**	**fledglings**
Hooded Plover	7	9	7	8
Little Tern	45	46	63	51
Pied Oystercatcher	Not available	5	Not available	7
Sooty Oystercatcher	1	1	1	1

The South Coast Shorebird Recovery Program was established in 1999 by the NSW National Parks and Wildlife Service (NPWS), to reduce the rate of decline of threatened shorebirds and recover populations by enhancing breeding success. The program is coordinated by NPWS staff and utilises over 100 dedicated volunteers as well as partnerships with local environmental groups and agencies including the BVSC. Areas of work include monitoring, habitat protection and raising community awareness of the species and their plight. The programs results for the 2012-2012 season were encouraging. Fox numbers were low and breeding success was good for all threatened species monitored (Table 26). Little Terns had the best breeding season on record.

Figure 38: Merimbula Star-hair *Astrotricha sp. Wallagaraugh* at Tura Beach

The endangered plant Merimbula Star-hair is found in only two locations in NSW, both within the Shire (Figure 38). During the reporting period a Draft Management Plan for the Bournda population of this species was commissioned by the BVSC in response to its occurrence on unreserved land in the Tura Beach area. This plan will be finalised during the next SoE reporting period. The Council is also assisting OEH in the redevelopment of the Threatened Species Priorities Action Statement (PAS) by reviewing the management and distribution of the Bournda Merimbula Star-hair population.

The 2011-2012 season appears to have been a good one for the Merimbula Star-hair population with numerous plants occurring outside the documented site for the species. A satellite population at Middle Beach Merimbula also appears to be thriving. Council is currently developing a formalised monitoring program for this species and data will be reported in future SoE reports.

The Southern Rivers CMAs Wangaalii—Potoroo Conservation project aims to engage and support Aboriginal and rural landholders using the Long-nosed Potoroo as a connection to country “vehicle” to promote conservation of the range of native fauna threatened by foxes. It hopes to improve the resilience, and reduce the risk of local extinction of the Potoroo from the Far South Coast.

During the reporting period the project delivered:

- 3,000 Ha of fox control on private land in the Tanja / Wapengo and Wallaga Lake localities
- Coordinated fox control across public and private land at a broad landscape scale
- 3 fact sheets
- 20 landholders trained in best practice fox baiting
- 10 landholders supported to manage foxes and monitor for Potoroos, foxes and other fauna
- Ongoing monitoring of Potoroo populations and fox populations at Wallaga Lake and Wapengo / Tanja
- MoU for agency commitment coordinated fox control program across national Parks and State Forests to complement the private land program

Monitoring is beginning to find evidence of Potoroo foraging in open forest indicating that the fox control program is working and predation levels have dropped.

b) Key threatening processes:

A key threatening process is defined in the Threatened Species Conservation Act (TSC Act) as a process that threatens, or could threaten, the survival or evolutionary development of species, populations or ecological communities.

Something can be a threatening process if it:

- adversely affects two or more threatened species, populations or ecological communities; or
- could cause species, populations or ecological communities that are not currently threatened to become threatened.

Threatening processes listed under the TSC Act that are predicted to be operating within the Shire are included in Table 27. An example of threatened species occurring within the Shire and potentially impacted by these processes is included along with mechanisms that are in place to mitigate the threats.

Table 27 Key Threatening Processes predicted for the Bega Valley LGA

Key Threatening Process	Examples of threatened species at risk	Examples of mechanisms currently in place to mitigate threat
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands	Blue-billed Duck	
Anthropogenic Climate Change	Long-footed Potoroo, Sooty Owl	Increasing resilience of populations through protection of landscape scale corridors as mapped in the CLEP 2012
Bushrock removal	Broad-headed snake (predicted to occur in the BVSC LGA)	
Clearing of native vegetation	Most listed species	Enforcement of legalisation such as the Native Vegetation Act
Competition and grazing by the feral European Rabbit, Oryctolagus cuniculus (L.)	Austral Toadflax	Council rabbit control program

Competition and habitat degradation by Feral Goats, Capra hircus Linnaeus 1758	Brush-tailed Rock-wallaby	
Competition from feral honey bees, Apis mellifera L.	Glossy Black Cockatoo, Squirrel Glider, Yellow-bellied Glider	
Death or injury to marine species following capture in shark control programs on ocean beaches	Humpback Whale, Australian Fur-seal	No beach netting occurs in the Shire
Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments	Hooded Plover, Pied Oystercatcher	Provision of bins and enforcement of littering legislation by council rangers
Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners	Koala,	
Herbivory and environmental degradation caused by feral deer	Southern Brown Bandicoot and Long-footed Potoroo	
High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition	Eastern Bristlebird, Southern Brown Bandicoot	use of Fire frequency thresholds and fire frequency mapping within the BVSC Bushfire Risk Management Plan
Importation of Red Imported Fire Ants Solenopsis invicta Buren 1972	Ground dwelling species	
Infection by Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species and populations	Gang-gang Cockatoo	
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis	Green and Golden Bell Frog	
Infection of native plants by Phytophthora cinnamomi	Southern Brown Bandicoot and Long-footed Potoroo	
Introduction of the Large Earth Bumblebee Bombus terrestris (L.)	Native plant communities	
Invasion and establishment of exotic vines and scramblers	Long-nosed potoroo	BVSC weeds program
Invasion and establishment of Scotch Broom (Cytisus scoparius)	Lowland Grassy Woodland (EEC)	BVSC weeds program
Invasion and establishment of the Cane Toad (Bufo marinus)	Green and Golden Bell Frog,	
Invasion of native plant communities by African Olive Olea europaea L. subsp. cuspidata (Wall ex G. Don Cirferri)	Native grasses and herbs, particularly tussock grasses	BVSC weeds program
Invasion of native plant communities by Chrysanthemoides monilifera	Eastern Bristlebird, Little Tern	BVSC weeds program
Invasion of native plant communities by exotic perennial grasses	Hooded Robin	BVSC weeds program
Invasion of the Yellow Crazy Ant, Anoplolepis gracilipes (Fr. Smith) into NSW	A range of terrestrial species	
Invasion, establishment and spread of Lantana (Lantana camara L. sens. Lat)	Eastern Bristlebird	BVSC weeds program
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	A range of species	BVSC weeds program
Loss of Hollow-bearing Trees	Gang-gang Cockatoo, Yellow-bellied Glider	Review of Development Applications to ensure impacts to high value habitat are avoided or mitigated
Loss or degradation (or both) of sites used for hill-topping by butterflies		

Predation and hybridisation by Feral Dogs, Canis lupus familiaris	Koala, Pied Oystercatcher	
Predation by Gambusia holbrooki Girard, 1859 (Plague Minnow or Mosquito Fish)	Green and Golden Bell Frog	
Predation by the European Red Fox Vulpes Vulpes (Linnaeus, 1758)	Long-footed Potoroo, Little Tern	Fox baiting undertaken by shorebird recovery and Potoroo conservation programs
Predation by the Feral Cat Felis catus (Linnaeus, 1758)	Little Tern	Monitoring and targeted trapping by Shorebird recovery Program
Predation, habitat degradation, competition and disease transmission by Feral Pigs, Sus scrofa Linnaeus 1758	Eastern Bristlebird, Long-nosed Potoroo	
Removal of dead wood and dead trees	Glossy Black-cockatoo	Review of Development Applications to ensure impacts to high value habitat are avoided or mitigated

The impacts of these threatening processes are generally not monitored and therefore comment cannot be made on their reduction or increase during the reporting period.

The development of outcome monitoring to assess the effectiveness of conservation programs within the Shire should be undertaken. Two examples programs that do conduct outcome monitoring are the Shorebird and Potoroo recovery programs (refer to Threatened Species section above).

The fox baiting associated with these programs has reduced the impact of foxes species at key locations within the Shire over the reporting period. Evidence of the success of these programs is seen in the breeding success of monitored shorebirds and early indications of an increase in foraging areas, particularly into open forest, of Potoroos.

Implications: Bega Valley Council needs to maintain appropriate effort and resources in the following areas of its environmental management.

- Improve our knowledge of the region's biodiversity through continuing support of community involvement in biodiversity conservation and monitoring (eg initiatives such as the Atlas of life on the Wilderness Coast and local environmental groups such as the Far South Coast Birdwatchers) and linking databases and information relating to biodiversity across government agencies. This, and close liaison with these agencies to encourage programs of data collection will aid conservation planners, land managers and members of the public to gain a clearer and more up-to-date picture of biodiversity within the region and associated management issues relevant to it. One of the highest priorities is to ensure standardised data collection methodologies are used to allow comparison of data sets across groups and agencies.

- Utilise a range of existing government agency programs which protect native species and ecosystems across NSW. This includes initiatives such as adopting regional strategies (eg. pest management strategies) and management plans conducted with other agencies, local government, landowners and the community.

- Work closely with the Southern Rivers Catchment Management Authority to help with implementation projects funded by the federal Clean Energy Futures grant should be a priority for the council over the next five years

- Implementing the NSW Threatened Species Assessment Guidelines (DECC 2007) to assist the community, developers and Council assessment staff to ensure the legislative requirements are readily understood. Utilise regional-scale Biodiversity Survey and Assessment Guidelines (DCE 2004) that provide information about how to approach survey and assessment of biodiversity to inform regional planning.

- Continue to ensure biodiversity impacts are adequately considered in planning for and implementing landuse zoning, assessment of development applications, road management and construction activities, stormwater management, hazard control burning and weed control activities. The regulation of these activities needs to be in accordance with legislative requirements and also include, as a minimum, consideration of terrestrial and aquatic native species and ecosystems generally, in addition to specific consideration of endangered ecological communities and vulnerable or endangered plant and animal species known or predicted to occur in the Shire.

- Incorporate best practice for biodiversity planning as outlined in the *Biodiversity Planning Guidelines for Local Government* (Commonwealth of Australia, 2006). This Guide aims to assist Councils carry out biodiversity conservation as part of their day-to-day functions, especially those relating to planning and development. The Guide highlights the importance of planning for biodiversity conservation and the need to integrate regulatory and other approaches to achieve improvement. It shows how Councils can conserve biodiversity through their existing regulatory and operational functions. The Guide does not create new planning processes, but presents a package of strategies and tools that can be applied within existing frameworks.

- Education of staff and the wider community on biodiversity is required. There is generally poor understanding of the importance of biodiversity in maintaining life support systems for human and environmental health. A broader understanding and appreciation of the values of biodiversity and will assist in underpinning future success in conserving biodiversity and critical ecological services.

- Help ensure appropriate (relevant and achievable) monitoring programs are in place to measure the effectiveness of Council's environmental policies, strategies, management activities and on-ground restoration projects in achieving desired biodiversity outcomes.

- Maintain collaborative arrangements with other land management agencies within the Region to ensure ongoing effectiveness with pest animal and plant control; fire

management; and to develop awareness of new land management principles, innovations or approaches.

5.2 Vegetation extent

NSW Office of Environment and Heritage (OEH) has recently completed a composite map of Biometric vegetation types and Endangered Ecological Communities (EECs) within the Bega Valley, Eurobodalla and Shoalhaven LGAs (OEHb, 2012). Biometeric vegetation types underpin a range of environmental assessments under NSW environmental legislation including the *Environment Planning and Assessment Act 1979*, the *Native Vegetation Act 2003* and the *Threatened Species Conservation Act 1995*. EEC extent data is contained in Table 28. Vegetation extent data from this mapping for Bega Valley Shire is included in Table 29. The mapping from this project provides a good general overview of vegetation extent within the Shire however local refinement is required to improve accuracy, particularly for EECs.

Throughout the intensively cleared farmland found in the valley floors of the Bega Valley Shire significant remnant vegetation is largely confined to road verges. Anecdotal evidence suggests that the condition of much of the significant roadside vegetation in the Shire has deteriorated since 2004 but no targeted monitoring has taken place. It is recommended that a council roadside vegetation management plan be developed. Part of this process would involve updating the significant roadside vegetation booklet (produced by the council in 2004) and reviewing the effectiveness of signage used to identify the areas of significant vegetation described in the booklet. The rapid assessment technique, recently trialled by the Cooma-Monaro Shire Council should be investigated to create GIS layers and assist the development of the plan.

Table 28: Extent of Endangered Ecological Communities and risk from high fire frequency within the Bega Valley Shire Council in 2011/12

Endangered Ecological Community	NSW status	Comm. status	Hectares in BVSC LGA	Fire threat
Bangalay sand forest in the Sydney Basin and South East Corner Bioregions	E3		1,081	Y
Brogo Wet Vine Forest in the South East Corner Bioregion	E3		5,181	Y
Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3		497	Y
Dry Rainforest of the South East Forests in the South East Corner Bioregion	E3		184	Y
Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3		2,297	N
Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3	CE	118	Y
Lowland Grassy Woodland in the South East Corner Bioregion	E3		9,544	Y
Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions	E3	E	238	Y

Natural Temperate Grassland of the Southern Tablelands of NSW and the Australian Capital Territory		E	242	Y
River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3		1,777	Y
Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3		332	N
Swamp sclerophyll forest on coastal floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3		224	Y
Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland in the South Eastern Highlands, Sydney Basin, South East Corner and NSW South Western Slopes Bioregions	E3		13,888	N
Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions	E3		1	N

Table 29: Extent of vegetation communities within the Bega Valley Shire in 2011/12

BVT ID	Vegetation Type	Hectares
Dry Sclerophyll Forests (Shrub/grass subformation)		
Southern Hinterland Dry Sclerophyll Forests		
SR511	Apple-topped Gum - White Stringybark open forest on ridges and upper	
SR511	Apple-topped Gum - White Stringybark open forest on ridges and upperslopes in the Waalimma area, far southern South East Corner	1,327
SR573	Maiden's Gum - White Stringybark shrubby open forest on granitic foothills, southern South East Corner	22,568
SR626	Silvertop Ash - Messmate - Mountain Grey Gum shrubby open forest of the hinterland ranges, southern South East Corner	21,296
SR666	White Stringybark - Maiden's Gum grassy open forest on granitic foothills, southern South East Corner	25,769
SR667	White Stringybark - Mountain Grey Gum - Maiden's Gum grassy open forest on granitic foothills and ranges, southern South East Corner	1,885
Dry Sclerophyll Forests (Shrubby subformation)		
South Coast Sands Dry Sclerophyll Forests		
SR512	Bangalay - Old-man Banksia open forest on coastal sands, Sydney Basin and South East Corner [1]	1,081
SR530	Coast Banksia - Coast Tea-tree low moist forest on coastal sands and headlands, Sydney Basin and South East Corner [1]	76
SR531	Coast Banksia - Coast Wattle dune scrub, Sydney Basin and South East Corner	1,615
SR640	Spinifex beach strand grassland, Sydney Basin and South East Corner unmapped	
South East Dry Sclerophyll Forests		
SR517	Blue-leaved Stringybark shrubby open forest of hinterland ranges, far southern South East Corner	722
SR554	Gully Gum - Wallaby Bush shrubby woodland on rocky ridges of the ranges, southern South East Corner	1,309
SR559	Ironbark - Woollybutt - White Stringybark open forest on coastal hills, South East Corner	13,896
SR566	Kybean Mallee Ash - Snow Gum heathy low open forest on the Wadbilliga Plateau, South East Corner	1,102
SR577	Messmate dry shrubby forest on sandstone, far southern South East Corner 114	
SR581	Mountain Grey Gum - White Stringybark open forest on sandstone mountain slopes, far south west South East Corner	1,023
SR596	Red Bloodwood - Silvertop Ash - White Stringybark heathy open forest on coastal foothills, southern South East Corner	14,176
SR611	Rough-barked Apple - White Stringybark dry open forest on lower slopes in the upper Tuross and Brogo River valleys, South East Corner	8,111
SR620	Silvertop Ash - Black She-oak shrubby open forest on hills of the Bega Valley, South East Corner	4,549
SR621	Silvertop Ash - Blue-leaved Stringybark - Red Bloodwood dry shrubby open forest on ridges of the hinterland foothills, northern South East Corner	3,696

BVT ID	Vegetation Type	Hectares
SR622	Silvertop Ash - Blue-leaved Stringybark - Woollybutt shrubby open forest on coastal foothills central South East Corner	31,116
SR623	Silvertop Ash - Blue-leaved Stringybark shrubby open forest on hinterland hills, far southern South East Corner	31,419
SR627	Silvertop Ash - Mountain Grey Gum shrubby dry open forest on ridges in Wadbilliga NP, South East Corner	6,609
SR630	Silvertop Ash - Rough-barked Apple shrubby open forest on the hinterland hills, far southern South Eastern Corner	17,015
SR631	Silvertop Ash - White Stringybark shrubby open forest of the escarpment ranges, southern South East Corner	1,632
SR633	Silvertop Ash open forest on exposed ridges of the escarpment ranges, far southern South East Corner	942
SR634	Silvertop Ash shrubby open forest on escarpment ridges, central and northern South East Corner	239
SR668	White Stringybark - Narrow-leaved Peppermint dry open forest on hinterland hills, far south of the South East Corner	10,980
SR673	Yellow Stringybark - Mountain Grey Gum shrubby open forest on slopes of the hinterland ranges, southern South East Corner	15,871
SR674	Yellow Stringybark - Silvertop Ash open forest on dry slopes of the escarpment ranges, northern South East Corner	7,095
SR675	Yertchuk - Silvertop Ash - Blue-leaved Stringybark shrubby open forest of the Wallagaraugh catchment, far southern South East Corner	22,905
Southern Wattle Dry Sclerophyll Forests		
SR519	Bodalla Silver Wattle very tall shrubland in the Brogo River and Desert Creek catchments, South East Corner	3,860
Wet Sclerophyll Forests (Shrubby subformation)		
South Coast Wet Sclerophyll Forests		
SR582	Mountain Grey Gum - Yellow Stringybark moist shrubby open forest in gullies of the coastal ranges, northern South East Corner	8,486
SR583	Mountain Grey Gum ferny tall moist forest on coastal ranges, southern South East Corner	26,663
SR609	River Peppermint - Rough-barked Apple moist open forest on sheltered sites, southern South East Corner	20,839
SR612	Rough-barked Apple shrubby open forest on gully flats, southern South East Corner	13,649
SR647	Swamp Gum - Ribbon Gum open forest on flats of the coastal and hinterland lowlands, southern South East Corner [1]	3,477
SR671	Yellow Stringybark - Coast Grey Box shrubby open forest on the coastal ranges, South East Corner	87
SR672	Yellow Stringybark - Mountain Grey Gum moist shrubby open forest on coastal ranges, southern South East Corner	24,376
Southern Escarpment Wet Sclerophyll Forests		
SR525	Brown Barrel - Mountain Grey Gum - Blanket Bush moist very tall open forest of the southern escarpment ranges, South Eastern Highlands and South East Corner	12,278
SR527	Brown Barrel - Narrow-leaved Peppermint moist tall open forest on escarpment ranges, southern South Eastern Highlands	10,841
SR553	Gully Gum - Sydney Peppermint - Yellow Stringybark moist open forest of coastal escarpments, southern Sydney Basin	780
SR576	Messmate - Mountain Grey Gum moist open forest of granitic foothills, southern South East Corner	18,714
SR580	Mountain Grey Gum - Brown Barrel very tall moist forest on escarpment ranges, central and southern South East Corner	12,638
SR607	River Peppermint - Narrow-leaved Peppermint open forest on sheltered escarpment slopes, Sydney Basin and South East Corner	862
SR619	Shining Gum - Brown Barrel very tall wet forest of the southern escarpment ranges, South East Corner	1,503
SR663	White Ash - Silvertop Ash - Brown Barrel shrubby open forest of the escarpment ridges, South Eastern Highlands and South East Corner	2,110
Wet Sclerophyll Forests (Grassy subformation)		
Southern Lowland Wet Sclerophyll Forests		
SR533	Coast Grey Box - Mountain Grey Gum - Stringybark moist shrubby open forest in coastal gullies, southern South East Corner	16,542
SR642	Spotted Gum - Grey Ironbark - Woollybutt grassy open forest on coastal flats, southern Sydney Basin and South East Corner	1,189
SR643	Spotted Gum - White Stringybark - Burrawang shrubby open forest on hinterland foothills, northern South East Corner	642
Grassy Woodlands		
Coastal Valley Grassy Woodlands		
SR543	Forest Red Gum - Coast Grey Box shrubby open forest on steep hills in the Bega Valley, South East Corner [1]	5,181

BVT ID	Vegetation Type	Hectares
SR544	Forest Red Gum - Rough-barked Apple - White Stringybark grassy woodlands on hills in dry valleys, southern South East Corner	9,283
Subalpine Woodlands		
SR584	Mountain Gum - Narrow-leaved Peppermint - Snow Gum dry shrubby open forest on undulating tablelands, southern South Eastern Highlands	1,038
Tableland Clay Grassy Woodlands		
SR603	Ribbon Gum - Snow Gum grassy open forest on flats and undulating hills of the eastern tableland, South Eastern Highlands [1]	9,280
Rainforests		
Cool Temperate Rainforests		
SR590	Plumwood - Soft Tree-fern cool temperate rainforest on cool, moist slopes and gullies of the escarpment ranges, South East Corner	1,437
Dry Rainforests		
SR551	Grey Myrtle - Lilly Pilly dry rainforest in dry gullies, Sydney Basin and South East Corner	1,213
SR613	Rusty Fig - Sweet Pittosporum dry rainforest on rocky slopes, southern South East Corner [1]	184
Littoral Rainforests		
SR571	Lilly Pilly littoral rainforest of the southern Sydney Basin and South East Corner [1]	42
Northern Warm Temperate Rainforests		
SR567	Lilly Pilly - Coachwood warm temperate rainforest on moist sheltered slopes and gullies, Sydney Basin and South East Corner	734
Southern Warm Temperate Rainforests		
SR569	Lilly Pilly - Sassafras warm temperate rainforest in moist sheltered gullies, Sydney Basin and South East Corner	56
SR570	Lilly Pilly - Sweet Pittosporum - Rough Tree-fern warm temperate rainforest in steep sheltered gullies, southern South East Corner	6,180
Forested Wetlands		
Coastal Floodplain Wetlands		
SR542	Floodplain wetlands of the coastal lowlands, southern South East Corner [1]	1,567
SR649	Swamp Oak - Prickly Tea-tree - Swamp Paperbark swamp forest on coastal floodplains, Sydney Basin and South East Corner [1]	332
SR650	Swamp Oak swamp forest fringing estuaries, Sydney Basin and South East Corner [1]	<1
SR651	Swamp Paperbark - Swamp Oak tall shrubland on estuarine flats, Sydney Basin and South East Corner [1]	224
Eastern Riverine Forests		
SR606	River Oak open forest of major streams, Sydney Basin and South East Corner	453
SR608	River Peppermint - Rough-barked Apple - River Oak herb/grass riparian forest of coastal lowlands, southern Sydney Basin and South East Corner	1,707
SR661	Water Gum - tea-tree- River Peppermint riparian scrub along streams, far southern South East Corner	353
SR665	White Sally Wattle - Leptospermum emarginatum riparian scrub of the Bega and Towamba valleys, southern South East Corner	346
Freshwater Wetlands		
Coastal Freshwater Lagoons		
SR536	Coastal freshwater lagoons of the Sydney Basin and South East Corner [1]	730
Coastal Heath Swamps		
SR538	Crimson Bottlebrush - Scented Paperbark wet heath in the hinterland hills, southern South East Corner	344
SR616	Scented Paperbark wet heath on coastal lowlands in far southern South East Corner	1,497
Montane Bogs and Fens		
SR579	Montane wet heath and bog of the eastern tablelands, South Eastern Highlands [1]	238
Saline Wetlands		
Mangrove Swamps		

BVT ID	Vegetation Type	Hectares
SR575	Mangrove forest in estuaries of the Sydney Basin and South East Corner	261
Saltmarshes		
SR614	Saltmarsh in estuaries of the Sydney Basin and South East Corner [1]	496
Heathlands		
Coastal Headland Heaths		
SR521	Bracelet Honey-myrtle - Coast Tea-tree tall shrubland on headlands, South Eastern Corner	20
South Coast Heaths		
SR617	Scrub She-oak - Swamp Banksia coastal lowland heath, southern South East Corner	1,943
SR646	Swamp Banksia - Slender Tea-tree wet heath on Mt Nadgee, southern South East Corner	359
Southern Montane Heaths		
SR541	Dwarf She-oak closed heathland of escarpment ranges, South Eastern Highlands	166
SR564	Kunzea ambigua - Bracelet Honey-myrtle shrubland on rhyolite outcrops, southern South East Corner	48
SR565	Kunzea ambigua - Correa reflexa shrubland on skeletal granitic substrates, southern South East Corner	147
Grasslands		
Maritime Grasslands		
SR563	Kangaroo Grass sod tussock grassland of coastal areas of the Sydney Basin and South East Corner [1]	1
Temperate Montane Grasslands		
SR540	Derived grasslands of the South Eastern Highlands and South East Corner	unmapped
SR610	River Tussock - Tall Sedge - Kangaroo Grass moist grasslands of the South Eastern Highlands [1]	242
[1] Contains EEC		

5.3 Pest plant control

a) Extent of pest plant infestations

Assessment: Favourable weather conditions have seen native vegetation, pastures and weeds flourish. The extent of pest plants increased during the reporting period despite strong management efforts due to favourable weather conditions.

Mapping capability is improving and, while the extent of spread of some of the target weeds is increasing, this increase often masks progress in effective management reducing densities. A good example is serrated tussock which, in the Towamba Valley in recent years, has been reduced from a >30% ground cover in Core areas to less than 10% in those areas. This reduction in ground cover means greater productivity in the agricultural sector and effective protection of conservation areas and Endangered Ecological Communities (EECs).

In the Bega Valley Shire in 2011/12 there were 101 noxious weeds listed by the NSW Department of Primary Industries (DPI). Of these, 29 are presently found, from individual small infestations such as Chilean needle grass to widespread weeds such as African lovegrass. Nine are listed by Council as having the greatest environmental and economic threat (Table 30). Six of these are listed as Weeds of National Significance under Federal legislation and one (Blue Hound's tongue) as a National environmental alert weed. Dominant weeds include African lovegrass, St John's wort, blackberry and, on a more localised scale, bitou bush, *Asparagus* sp. Environmental weeds, including garden escapes, such as *Polygala* sp., weedy vines and succulents are found particularly in and around built-up and highly trafficked areas along the coastal fringe.

The spread of aquatic weeds within river systems was an issue within this reporting period due to large flooding flushing weeds through river systems. In particular, *Sagittaria graminea*, found on Brogo Dam (owned and managed by NSW Water), spread down the Brogo River and has the potential to invade the Bega River system. While NSW Water, Council and SRCMA are undertaking a joint control program, this weed is currently on listed as a Class 5 noxious weed which means that affected landholders may decline to be part of the control program.

Figure 39: Vegetation Officer Terry Thompson holds bright green Salvinia with Azolla in the background.

Flooding in March 2012 flushed aquatic weed, *Salvinia molesta,* into a dam on the Jellat Jellat flooplain (Figure 39). It is a Class 2 noxious weed and has the potential to spread throughout the area and into the Bega River system. Strict monitoring and controls are in place.

Table 30: Summary of Pest Plants in Bega Valley Shire 2011 2012

Plant species		Noxious weed	Weed of National Significance	National Environmental Alert List weeds	Currently impacting/ threatening native species	Potential threat to native species
Scientific name	Common name					
Asparagus sp	Bridal creeper, asparagus fern	Y (some)	Y		Y	Y
Chrysanthemoides monilifera	Bitou bush, boneseed	Y	Y		Y	Y
Cynoglossum creticum	Blue Hound's tongue	Y		Y	Y	Y
Eragrostis curvula	African lovegrass	Y			Y	
Euphorbia paralias	Sea Spurge				Y	Y
Hyparrhenia hirta	Coolatai grass					Y
Hypericum perforatum	St. John's wort	Y			Y	Y
Lantana sp	Lantana	Y	Y			Y
Nassella neesiana	Chilean needle grass	Y	Y		Y	Y
Nassella trichotoma	Serrated tussock	Y	Y		Y	Y
Rubus sp	Blackberry	Y	Y		Y	
	Garden escapes				Y	Y

Implications: In general, weeds that are not declared noxious continue to spread unchecked on the whole.

African lovegrass, which established in the Shire many years ago, is encroaching into areas where it has not previously been found. It has spread to the extent that management is difficult and effective control almost impossible without a huge input of resources. Difficulty in identifying emerging grassy weeds increases the likelihood of emerging infestations establishing over a wide area before they are identified, thus increasing cost and difficulty of management. Generally landholders take little or no action to control noxious weeds while they occur only in small areas on their land. Despite significant work being done to publicise the threat weeds pose to both agricultural enterprises and areas set aside for conservation purposes, land managers tend to react only when it becomes widespread.

Weeds such as sea spurge and beach daisy, the seeds of which are waterborne and travel long distances, will continue to infest coastal areas unless removal is on-going and community members continue to become involved in caring for their coastline.

The nursery industry and more importantly, the Internet, chain stores, market outlets and individual growers continue to sell invasive species.

b) Identify pest plants causing threatening processes.

All weedy plant species threaten the integrity of native and introduced pastures on agricultural land, native grassland and woodland in areas managed for conservation purposes, coastal vegetation communities and endangered ecological communities. The more widespread weeds pose a significant threat to Myanba fig forest, dry rainforest, snow gum grassy woodlands and lowland grassy woodlands.

Grassy weeds threaten the integrity of snow gum and lowland grassy woodlands. Grassy weeds pose significant threats to agriculture, conservation land management and Endangered Ecological Communities (EECs) throughout the Shire.

Riparian weeds, such as blackberry, turkey rhubarb, Tradescantia and periwinkle, continue to threaten riparian communities.

Other weedy grasses, such as Chilean needle grass, cane needle grass and the recently found Coolatai grass, pose a threat to the South Coast. Small isolated infestations are being targeted for eradication with current on-going works being successful. The threat of these and other grassy weeds invasion is very high if new infestations remain undetected and/or unreported and untreated.

Bitou bush and other coastal weeds pose significant threats to littoral rainforest, Bangalay sand forest, southern lowland grassy woodland and coastal saltmarsh communities. Coastal vegetation communities are also under threat from sea-borne weeds such as sea spurge and beach daisy.

While few garden plants are listed as noxious, many are aggressively invasive, threatening reserves, national parks and EECs, including Bangalay sand forest, southern lowland grassy woodland and coastal saltmarsh communities.

c) Actions to reduce pest plants

Assessment: Council has an extensive weed management program covering the Shire. Annual inspections of private properties totalled 977 which included reinspections of about 30% of properties.

NSW DPI, through its Crown Lands division, assists Council with some funding for weed control on targeted unoccupied Crown Lands. In 2011-12, a grant of $8,850 assisted Council in control of serrated tussock, African lovegrass, St John's wort, bitou bush, blackberry, lantana, blue hound's tongue (an Alert Weed) and environmental weeds on a number of Crown Land reserves within the Shire. NSW DPI also provided funding of $10,000 through SRCMA to directly assist weed removal programs on cliffs within Crown reserves as part of the Coastal Weeds Project in which Council is a partner.

NSW DPI partially funds the South Coast Weeds Action Program, with member Local Control Authorities also providing significant funds to implement regional weed management programs. Through this program, DPI provides significant funding for works on new and emerging weeds and educational and awareness programs. Council

contributes funds to these works as well resourcing the widespread weed management programs.

The roadside and Council owned or managed land spraying program expenditure, much of which is done by contractors, totalled $182,886 while expenditure on inspections and associated administrative work was $244,383.

While inspection and control programs are successful, long-term on-going work is required to build on success. The extent of areas affected by serrated tussock, blackberry and St John's wort have been reduced over time but vigilance is needed particularly when growing conditions are favourable as they have been over the last two years.

Roadside control of African lovegrass is an annual program, minimising spread, but despite this it has spread significantly on private land throughout the Shire, particularly in the Bega River valley. Other roadside weeds targeted annually include St John's wort, serrated tussock, emerging grassy weeds, lantana, bitou bush and blue hound's tongue while blackberry is targeted triennially.

The bitou bush management program has been a great success with Council working alongside Tathra Landcare at Tathra achieving a massive reduction over the 19 years the group has existed. Lantana and blackberry programs control on Murruna Point Crown Land have likewise been very effective. All programs require follow annual up to ensure the gains made are not lost.

Raising community awareness is a significant and important part of the weed management program through field days, workshops, media and publicity, providing relevant publications. Over 2011-12, Council expended $14,177 dollars on this program. Many of the activities are done jointly with other agencies and information distributed through other land managers' email and other news networks.

Council's environmental levy supports a number of initiatives throughout the Shire. A percentage of the levy is made available to community groups for weed management, vegetation rehabilitation and planting programs while a significant part is used to undertake projects. In the last year these have included, weed control and planting at Kisses Lagoon in Bega, a joint weed management and rehabilitation program along Bega River in Bega with SRCMA, a sand dune restoration project in Merimbula involving extensive weed management, fencing and rehabilitation of the area, support for a rehabilitation program in Tathra, among other smaller works.

Trials underway to better manage grazing, exclude weedy species and reduce African lovegrass density continue to be publicised through field days while a local leaflet on its management has been published and distributed both as hard copy and on Council and other websites.

Figure 40: Coastal weeds project: Ross Thomas, Ron Thomas and Eric Dixon tackling bitou bush

Council undertakes annual control programs on noxious weeds which includes roadside and Council-owned and managed land control programs, private property inspection programs, specific weed management projects and participates in joint weed management and vegetation rehabilitation projects with agencies, the chief one of which is Southern Rivers CMA, as well as National Parks and community groups, including Landcare groups.

Implications: The success of any weed management is determined by effective on-going management of an area. Part of that management must be the replacement of invasive species with appropriate competitive vegetation. Programs over recent years have become much more holistic in their approach with rehabilitation and revegetation promoted and more widely accepted as part of weed management. This approach is seen at the catchment level, with the Towamba project focussed on broader farm management issues as well as projects aimed at protecting EECs within the catchment, and at local level where small discrete projects, often supporting bigger projects, achieve good environmental outcomes.

Continuing education and awareness programs emphasise the long-term nature of weed management. While annual weed control programs are successful, broader vegetation and stock management programs must be part of any program to ensure sustainable long-term gains.

Figure 41: Landholders and agency representatives in a field discussion at Towamba

Towamba Valley Grassy weeds management: is a cooperative program between local landholders, SRCMA and Council (Figure 41). The program is coordinated by a SRCMA and Council funded Project Officer. This model continues to achieve good results, with a high level of landholder participation in serrated tussock and other weed management and vegetation rehabilitation programs and an overall strong commitment to effective weed management.

Coastal weeds project (Figure 42): is a collaborative program between SRCMA, NPWS and the Bega Valley Land Council. Local Koori work crews undertake bi-annual sweeps of the beaches and hinterland, targeting sea spurge and beach daisy and, more recently, weeds such as bitou bush, lantana and garden escapes. The program has reduced

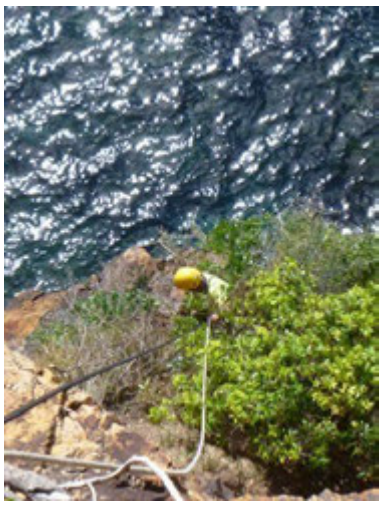


Figure 42: Coast Weeds Project: Contractor tackling Bitou bush, at Tathra cliffs

infestations of sea spurge and beach daisy to less than 10% of previous densities in this Shire. The program's success has resulted in a similar program along the north Gippsland coast. The education and awareness component of this project has been vital in raising community and gardeners' awareness of the threats many garden plants pose to the surrounding public lands.

5.4 Pest animal control

Assessment: Rabbits are the only pest animal that Council is responsible for controlling on its own lands and other areas managed by Council, many of which are in urban and other built-up areas (Table 31). Recent changes to requirements when using pesticides have meant that control is largely done using Rabbit Calici Virus.

Rabbits threaten all ecological communities, disturbing soils, allowing pest plant species to invade. They also threaten native animals such as bandicoots and potoroos, competing for food and changing the vegetation structure and composition. Over $3,000 was spent on rabbit management programs during the year, with community input possibly doubling that figure where people were willing to do free-feeding prior to distribution of the virus.

Table 31: Summary of pest animals in the Bega Valley Shire in 2011/12

Animal species		Currently impacting/threatening native species (indicate which species)	Potential threat to native species (indicate which species)
Scientific name	Common name		
Oryctolagus cuniculus	Rabbit	EECs, threatened plants, common bandicoot, long-footed potoroo	

Implications: While effective in the short term, the rabbit control program is less so in the longer term. Annual rapid rises in rabbit numbers will continue while private landholders neglect their responsibilities. Rabbits will continue to compete for food and shelter with native animals, cause erosion and, with their heavy grazing and burrowing activities, provide ideal opportunities for the invasion of weedy plants.

5.5 Fire Management

a) Area of land affected by fires by fire frequency and intensity of burn and by type of plants and animals affected.

In 2011/12, 4605 hectares of land (approximately 0.7% of the Shire) was burned in the Bega Valley Shire from prescribed burns. No information was available on the effects of fire on fire-sensitive vegetation communities in the Shire.

Table 33: Threatened flora and fauna species at risk from high fire frequency, Bega Valley Shire

Order	Common Name	Scientific name
Mammal	Long-footed Potoroo	*Potorous longipes*
	Long-nosed Potoroo	*Potorous tridactylus*
	Southern Brown Bandicoot	*Isoodon obesulus obesulus*
	Spotted-tailed Quoll	*Dasyurus maculatus*
	Squirrel Glider	*Petaurus norfolcensis*
Bird	Eastern Bristlebird	*Dasyornis brachypterus*
	Eastern Ground Parrot	*Pezoporus wallicus wallicus*
	Glossy Black Cockatoo	*Calyptorhynchus lathami*
Plant	Narrabarba Wattle	*Acacia constablei*

The NSW Rural Fire Service (RFS) advocate prescribed burning in populations of sixteen threatened plant and animal species that occur in the Shire. High fire frequency is considered a key threatening process to eight threatened fauna species and one threatened plant known to occur in the area (Table 33) (OEHc, 2012). Inappropriate fire frequencies may put more threatened plant and animal species at risk.

Bega Shire contains fourteen (14) EECs, of which ten (10) are at risk from fire or inappropriate fire regimes (Table 28) (OEHc, 2012 and DSEWPC, 2012). No information was available to assess the impact of fire on these communities during the current reporting period.

A bush fire risk management plan was prepared for the Shire in 2010 and covers a five year period. It is the overarching plan used to guide fire management strategies and measures in the Shire. The plan can be found at the following link: http://www.rfs.nsw.gov.au/file_system/attachments/State08/Attachment_20100702_91EC3515.pdf

Occurrence of fires: The 20011/12 bushfire season was relatively quiet due to cooler and wet summer conditions. Two relatively small two wildfire events occurred in the reporting period in Brogo Wilderness and Jingerra Rock near Wyndam. These were both caused by lightning strike and were brought rapidly under control.

Impacts of fires on native species and communities: No information is available on the effects of wildfires and hazard reduction burns on vegetation communities within the Bega Valley Shire over the reporting period. The bushfire characteristics of major vegetation types in the Shire and their fire thresholds are outlined in the Shire's Bush Fire Risk Management Plan (BVSBFMC, 2010, Table 3.3).

Council partnered with the Bemboka Landcare and RFS to conduct an ecological burn program within the Bemboka Reserve. A Review of Environmental Factors (REF) was prepared during the reporting period while the program will occur within the next reporting period. The objectives are to reinstate natural processes including tussock inter-spacing suitable to re-establish native forbs, as well as to decrease fire risk to the town by reducing fuel loads. A monitoring program has been developed to assess the outcomes of the program.

Additionally, Council partnered with the RFS to undertake a trial to monitor the impact of fire on the threatened species, Merimbula star-hair in the Tura Beach area. This trial will occur within the next reporting period.

b) Council's fire management strategies, guidelines and bushfire risk management plans.

Bush Fire Risk Management Plan: Council continued its role as a member of the Bega Valley Shire Bushfire Committee and worked co-operatively with the other member agencies in the implementation of the Bush Fire Risk Management Plan (2010). This document maps bushfire risk across the Shire using a new Risk Planning Process under the Bushfire Risk Information Management Systems (BRIMS) format (Section 2) and outlines strategies that land managers will undertake to manage identified bushfire risks.

The plan addresses protection of natural and cultural values and protection of life and property, and also provides information relating to threatened species, populations, communities and critical habitat. It refers to approved Recovery Plans and the specific fire management requirements for each species or community. The plan examines bushfire risk for all parts of the Shire and prescribes various treatment methods, frequencies and intensities.

Low intensity prescribed burns are largely restricted to areas of dry eucalypt forest, woodlands and some heath land areas. Fuel management in localised areas will have an impact on some species of wildlife, with those depending on a dense understorey of shrubs being the most likely to be adversely affected.

Planning at the strategic level (as is the purpose of this plan) aims to protect human life and property values while minimising detrimental impacts on the environment of intense broad area wildfires and too frequent or infrequent prescribed fire. Where prescribed fire is used as one of the tools to achieve this, the aim is to burn sufficiently frequently to prevent general fuel accumulations which may carry high intensity wildfires, while burning at long enough intervals to ensure the continued survival of plant species and habitat for wildlife.

Asset Protection Zone Program: Bega Valley Shire Council undertakes regular maintenance over its extensive asset protection zone network to reduce the risk of assets from fire. Risks from bushfire identified in the Climate Change Risk Assessment (2010), have been incorporated into Council's Asset Protection (APZ) program for Council managed bushlands and reserves.

5.6 Conservation management responses

During the reporting period a wide range of conservation management initiatives and projects were undertaken within the Shire.

Draft Comprehensive Local Environmental Plan 2012: Conservation management within the Shire has been progressed through release of the draft Comprehensive Local Environmental Plan 2012 (CLEP) for public comment. High value biodiversity areas were identified and rezoned E2 Environmental Conservation and E3 Environmental Management zones to protect sensitive coastal locations with high environmental value. A landscape approach to biodiversity conservation was adopted during the development of the CLEP, with high biodiversity value areas including corridors identified across the shire and added to the CLEP as a discreet map layer. This ensures that development that is proposed in these areas takes into account any potential negative impact to the environment and ensures inappropriate development is not permitted. This mapping has

been incorporated into a larger Far South Coast Corridor mapping layer (OEH 2012) which identifies corridors throughout the Shoalhaven, Eurobodalla and Bega Valley LGAs ensuring far reaching biodiversity benefits. Estuarine ecosystems also receive increased protection under the CLEP. These waterways are now zoned to prevent environmental degradation through inappropriate development.

Community engagement: Community involvement in biodiversity management and monitoring was also promoted through the BVSC and Southern Rivers CMA supported Far South Coast Conservation Management Network (CMN).

The CMN aims to maintain a lively network of interested landholders with a high level of knowledge, skills and motivation to recover and manage native vegetation on their properties.

The project partners include Bega Valley Shire Council, National Parks and Wildlife Service, Department of Primary Industry, South East Livestock Health and Pest Authority & Far South Coast Landcare Association

During the reporting period the project delivered:

- 2 awareness—raising events (50 people)
- 2 training events (50 people)
- 4 quarterly news letters (distribution list 400+)
- 2 media items
- CMN web site maintained

Amphibian research: A project is currently underway that will shed light on the status of frog species within the Shire. This project is being conducted in the context of worldwide declines in frog populations, first identified in the 1970s. Globally, nearly one-third of the world's 6140 species are threatened with extinction and causes of decline are frequently unexplained. The Bega Valley hosts one of the highest species richness of frogs anywhere in temperate Australia with 25 species of frog known including six threatened species. Despite this, little is known of the frog communities of the region. It is uncertain if frogs have experienced similar declines in the Bega Valley as that has occurred across the globe.

To address these knowledge gaps local ecologist Steve Sass has commenced a 6-year study that asks the following questions:

- Has the spatial extent of frog populations of the NSW far south coast declined?
- What habitat covariates can best predict species distribution/habitat occupancy?
- Is there a difference in frog/tadpole communities between rain-filled depressions and permanent wetlands?

This project commenced in 2011 and will provide valuable data for subsequent SoE reporting and for riparian and wetland management across the Shire.

Far South Coast Bird Watches Indian Myna Control Group: The Common Myna is an introduced species, regarded as a pest. Using tree hollows for nest sites they compete aggressively for those hollows with our preferred native fauna species.

For over 10 years the Common Myna has been appearing in isolated spots within the Bega Valley Shire, spreading south from the northern shires. In response to the influx of this pest the Far South Coast Birdwatchers Common Myna Task Force has been humanely eliminating the species, with over 600 removed over the last 10 years. This action has ensured that the Indian Myna is not widely established in the Bega Valley and has effectively halted the spread of this species to the south. During the period from 2010 to October 2011 60 Mynas were removed from one property in the North of the Sire. No birds were subsequently sighted on this property during the reporting period.

Clean Energy Futures Grant: The Southern Rivers Catchment Management Authority has recently secured a large federal grant through the Clean Energy Futures program. This money is allocated for biodiversity works over the next five years to enhance and restore koala habitat within the Shire. The Southern Rivers CMA will manage a range of projects including revegetation, weed management, threatened species monitoring and management and community capacity building to be undertaken, in collaboration with other land management agencies including the BVSC. These projects are currently being developed and promise to significantly advance the understanding and conservation of biodiversity within the sire. The projects are planned to run for at least five years and will be reported on in subsequent SoE reports.

6. Our community

This section assesses Council's achievement towards the Strategic Priority: *S2: Manages Development*, outlined in the Bega Valley Community Strategic Plan (CSP) 2011. The indicators used to measure the effectiveness of Council's management in maintaining our rich biodiversity are outlined in Table 353.

Table 343: Indicators used to assess Council's management in maintaining the liveability of the Shire.

Indicator	Measures	Description
6.1:Environmental attitudes	a) Results and trends of surveys that measure the environmental attitudes and opinions of the community.	This indicator reports on attitudes and opinions towards the environment within a local council area.
6.2: Air quality	a) Type and trends of common emissions and pollutants. b) Initiatives to improve air quality & quantify success.	Assesses effectiveness of initiatives implemented by Council to improve air quality.
6.3: Noise	a) Number of noise complaints & type & extent of noise. b) Abatement measures implemented & quantify success.	Assesses effectiveness of initiatives implemented by Council to reduce significant impact from noise.

6.1 Environmental attitudes

Assessment:

Bega Valley Shire Community Survey: Management Report: was commissioned by Council in 2009 to survey the community's attitudes towards Councils services. The survey assessed the importance community members placed on each service.

Environmental services all ranked *High Importance,* with "Bushfire protection", "Clean creeks and waterways", "protection of natural bushland" and "weed control" ranking the highest (Table 35).

Table 35: Importance of Council's environmental services to the community in 2009

	Importance		
Council Services	**Low**	**Med**	**High**
Infrastructure and basic services			
Bushfire protection			X
General waste collection			X
Water services			X
Recycling collection			X
Sewerage and septic services			X
Environment			
Clean creeks and waterways			X
Protection of natural bushland			X
Weed control			X
Environmental monitoring and protection			X
The way trees are managed on both private and public land			X
The way residential and rural lands are developed			X
Control of dogs and cats			X

Who cares about the Environment? Surveys: is social research that measures environmental values and attitudes, knowledge and views, behaviours and motivations of NSW residents and tracks how these have changed over time. Conducted every three years by the Office of Environment and Heritage, the surveys span from 1994 to 2009 and can be found at: http://www.environment.nsw.gov.au/community/Whocares2009.htm

In 2009, the environment remained a priority for people in NSW. It is one of the five most mentioned priority issues for attention in NSW, both now and in the future. There has also

been a marked growth in people's knowledge and concerns specifically about climate change.

Implications: In 2009 the environment ranked highly amongst members of the Bega Valley Shire. Council commissioned a new survey of community's attitude at the time of reporting. The results will be reported on in the next reporting period and will allow assessment of whether attitudes towards the environment have changed since the 2009 survey.

6.2 Air quality

Poor air quality affects us all. It can also have effects on most other living things, on ecosystems, and on buildings and facilities - as well as detracting from our enjoyment of the Bega Valley Shire.

Air quality is usually assessed by the continuous, regular monitoring of various pollutants - chosen because of their known or suspected health effects, or because they are precursors to the formation of other pollutants. Small airborne particles, and the gases nitrogen dioxide (NO_2), carbon monoxide (CO) and ozone (O_3) are four examples. Motor vehicles are the main source of many air pollutants. Also considered under air quality are the global issues of ozone depletion and climate change.

Assessment: In general, the air quality in the Bega Valley Shire is considered to be very good. The Shire has comparatively little heavy industry and all townships are far enough south of Sydney and Wollongong to avoid any adverse air quality impact from these sources.

Motor vehicle emissions and smoke from bush fires in summer are two sources of likely air contaminates which are present from time to time. In addition to this, during winter months some towns may experience temporary and minor adverse effects from smoke emissions from solid fuel heaters together with fire management burns by private landholders and by the Rural Fire Service and the National Parks & Wildlife Service. Also complaints relating to the burning of vegetative matter in the open within urban areas have increased over recent times.

Council continues its current service standards in response to residential minor air pollution complaints and has extended these to cover complaints arising from commercial premises.

During the reporting period Council received 4 customer requests relating to air pollution matters in the reporting period. These included inquiries and complaints relating to odours (1), smoke (2) and general (1).

To better protect the local community Bega Valley Shire Council sought listing under Schedule 8 of Protection of the Environment Operations (POEO) Regulation 2010. Council staff is in the process of developing policy and administrative processes to give support to this listing. Following the introduction of the "Control of Open Burning Policy" persons seeking to burn material in the open will be required to have in place an approval

from Council. Advice from other Council areas that have adopted similar policies is that air quality particularly within urban areas improved greatly.

Implications: Reliance on wood as a heating energy source and the reliance on motor vehicles are known to impact air quality and potentially human health. This is likely to be the case in the Bega Valley, though ambient air quality monitoring data is not collected to quantify this. Listing in the POEO Regulation will improve air quality at a local level, as will the construction of the Princes Highway Bega bypass.

6.3 Noise

Assessment: Noise pollution can disturb our work, concentration, relaxation and sleep. It can cause stress and create or worsen physical problems such as high blood pressure, chronic exhaustion and heart disease. The Bega Valley Shire generally does not experience high levels of ambient noise. As expected with a regional rural local government area most areas of the Shire are very quiet. Only urban areas experience noise above these quiet levels largely associated with traffic noise and typically on an intermittent basis. Ambient noise monitoring is therefore not undertaken by the Council.

As such data regarding noise impacts is only able to be defined through the number of formal noise complaints received for the reporting period. This does not however include complaints relating to noise impacts from scheduled and NSW Government regulated premises as this data was not available for the reporting period.

Council received 60 noise complaints during the reporting period (Figure 50). Of those 44 related specifically to barking dogs. Twenty-two general noise complaints were received during the year with motor bikes and amplified music complaints being the most common.

The NSW Police data was not able to be sourced for this reporting period.

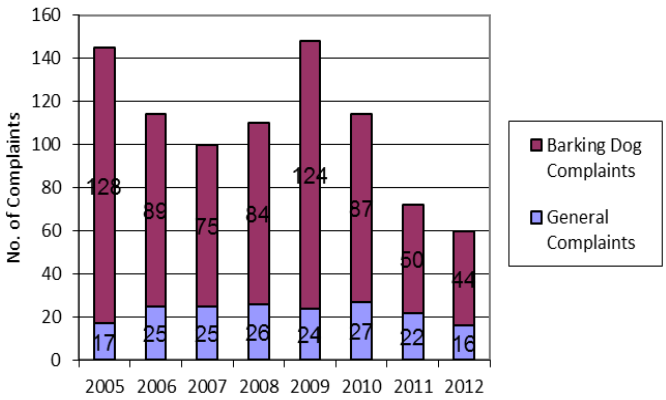


Figure 50: Annual number of noise complaints received by Council between 2005 and 2012.

Implications: Council addresses separate noise complaints in accordance with the Protection of the Environment Operations Act 1997 and has an acoustic logger and handheld noise meter to facilitate investigations. In addition those proposed premises or activities that potentially create excessive noise are also able to be regulated through the development assessment and consent processes.

Acoustic assessment continued through this reporting period and is of high significance in any proposed development assessment. Staff training in regards to acoustic assessment is kept up to date to ensure appropriate skills are maintained.

References

ANZECC (2000). Australian and New Zealand Guidelines for Fresh and Marine Water Quality.

Bega Valley Shire Bush Fire Management Committee (2010). Bush Fire Risk Management Plan, Bega Valley Shire Council, Bega.

Bega Valley Shire Council (2011). *Bega Valley 2030 Community Strategic Plan (CSP)*. BVSC.

Bega Valley Shire Council, (2012). Draft Comprehensive Local Environment Plan (CLEP) (2012). Adopted by Council in 2012 and awaiting gazettal by the Minister at the time of reporting.

Commonwealth Scientific and Industrial Research Organisation (CSIRO) (2007) *Climate Change in the Southern Rivers Catchment,* brochure, CSIRO, New South Wales.

Department of Environment, Climate Change & Water (DECCW) (2009a). MER sampling protocols. Authors P. Scanes, J. Dela-Cruz and G. Coade. Department of Environment Climate Change and Water 2009.

Department of Environment, Climate Change & Water (DECCW) (2009b) CERAT – Coastal Eutrophication Risk Assessment Tool, CD-Rom. Department of Environment Climate Change and Water 2009.

Department of Environment, Climate Change & Water (DECCW) (2009c), *Derivation of the NSW Government's sea level rise planning benchmarks,* DECCW NSW, Sydney.

Department of Environment, Climate Change & Water (DECCW) (2011) State of the catchments 2010 Estuaries and Coastal Lakes – Southern Rivers region. Available online at URL: http://www.environment.nsw.gov.au/resources/soc/southernrivers/10603SRestuarine.pdf

Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) (2012). Species Profile and Threats Database for Natural Temperate Grassland of the Southern Tablelands of NSW and the Australian Capital Territory, http://www.environment.gov.au/cgi-bin/sprat/public/publicshowcommunity.pl?id=14&status=Endangered

Echelon (2010). Bushfire Risk Assessment: Adaption report, prepared for the Bega Valley Shire Council, December 2010.

Elgin (2011a). Baragoot Lake: Environmental Monitoring in coastal lakes and lagoons of Bega Valley Shire Council region, 2010-2011. DRAFT. Prepared for Bega Valley Shire Council, Bega.

Elgin (2011b). Cuttagee Lake: Environmental Monitoring in coastal lakes and lagoons of Bega Valley Shire Council region, 2010-2011. DRAFT. Prepared for Bega Valley Shire Council, Bega.

Elgin (2011c). Middle Lagoon: Environmental Monitoring in coastal lakes and lagoons of Bega Valley Shire Council region, 2010-2011. DRAFT. Prepared for Bega Valley Shire Council, Bega.

Elgin (2011d). Pambula Lake: Environmental Monitoring in coastal lakes and lagoons of Bega Valley Shire Council region, 2010-2011. DRAFT. Prepared for Bega Valley Shire Council, Bega.

Elgin (2011e). Wallagoot Lake: Environmental Monitoring in coastal lakes and lagoons of Bega Valley Shire Council region, 2010-2011. DRAFT. Prepared for Bega Valley Shire Council, Bega.

Elgin (2011f). Wapengo Lake: Environmental Monitoring in coastal lakes and lagoons of Bega Valley Shire Council region, 2010-2011. DRAFT. Prepared for Bega Valley Shire Council, Bega.

Informed Decisions (.id) (2012). Bega Valley Shire: Residential and economic role and function analysis, July 2012. DRAFT. Prepared for Bega Valley Shire Council, Bega.

Informed Decisions (.id) (2010). Bega Valley Shire: Population and Household Forecasts, February 2010. Prepared for Bega Valley Shire Council, Bega. Available online at URL: http://forecast2.id.com.au/templates/forecast2/Clients/354Bega/PDF/10.pdf

New South Wales Office of Water (2011). *Water Sharing Plan for the Bega and Brogo Rivers Area Regulated, Unregulated and Alluvial Water Sources – Guide, March 2011.* Available online at URL: http://www.water.nsw.gov.au/Water-management/Water-sharing-plans/Plans-commenced/Water-source/Bega-and-Brogo-Rivers/default.aspx.

OEHa 2012, New South Wales State of the Beaches 2011-2012: South Coast region, http://www.environment.nsw.gov.au/beach/reportann.htm.

OEHb 2012, Biometric vegetation types and endangered ecological communities of the Shoalhaven, Eurobodalla & Bega Valley local government areas. Technical Report. NSW Office of Environment & Heritage, Queanbeyan.

OEHc 2012, *High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition*, profile updated 1/9/2012. http://www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=20014

Office of the Commissioner for Environment and Sustainability (2009). Australian Capital Region Sustainability Steps: a Pathway to State of the Environment Reporting.

Williams, R.J., West, G., Morrison, D. and Creese, R.G. (2006). Estuarine Resources of New South Wales, prepared for the Comprehensive Coastal Assessment (Department of Planning) by the NSW Department of Primary Industries, Port Stephens.