



# Natural Resources

## 2015 Annual Report

# Natural Resources Branch

The 2014-15 financial year saw the Natural Resources Branch deliver programs in bushland restoration and recreation, Bushcare and Community Nursery, bushfire management, biodiversity assessment, water quality monitoring, catchment remediation, estuary management and environmental sustainability. This report summarises the major achievements.

Highlights of the year include:

## Grants

- \$74,000 for estuaries from Office of Environment and Heritage, with \$50,000 earmarked for the monitoring of the Hawkesbury River's waterways and \$24,000 to go towards rehabilitation and management of foreshore vegetation
- \$3,944 from Rural Fire Service for asset protection zone maintenance
- \$20,000 through Local Land Services Native Vegetation Project for Terrys Creek bush regeneration
- \$29,000 through Local Land Services Biodiversity Conservation project for Byles Creek
- \$6,765 from NSW Rural Fire Service for Asset Protection Zone maintenance
- \$25,590 Noxious Weed Inspectorial Grant from Department of Primary Industries
- \$63,384 Green offset for Surrey Street, Epping
- \$37,357 M2 Public Benefit Monies

## Awards

- WINNER 2014 NSW Coastal Management Innovation Award for 'Hawkesbury Watch' website which displays daily swimming conditions, estuarine health grades and real time data via five monitoring buoys on Council's website and a free app
- Clean4Shore program (funded by Council) WINNER 'Hey Tosser! Litter Reduction Award' in NSW Environment Protection Authority, Clean Beaches Connecting our Coast Awards 2014 in December
- In partnership with Greater Sydney Local Land Services' Floating Landcare program, WINNER 'Environmental Protection Award' at the 2014 Keep Australia Beautiful NSW Clean Beaches Awards in December

## Achievements

- Stormwater harvesting feasibility study completed examining the viability and potential water quality benefits of stormwater harvesting at 10 of Council's sportsfields.

- Seven tonnes of rubbish removed from the Hawkesbury River by over 400 volunteers as part of Council's Clean4shore program.
- Solar panels installed at Hornsby Library and Thornleigh Works Depot expected to save Council almost \$30,000 per year
- Biobanking agreement created for Upper Pyes Creek and New Farm Road bushland. Biodiversity credits sold to NorthWest Rail Link and Epping to Thornleigh Third Track for over \$2.5m which ↑ will fund restoration of the bushland in these reserves in perpetuity. In addition, biodiversity credits worth over \$1.2m for Dog Pound Creek Biobank site sold to the Office of Environment and Heritage, which will fund restoration of bushland in these reserves in perpetuity.
- Seagrass education campaign with signage, stickers and promotional material displayed in marinas and fishing stores within Brooklyn and surrounds.
- Clean-up of the Hawkesbury at Spectacle Island, Sandbrook Inlet and areas in the Berowra catchment through Council partnership with local schools and community groups.
- Bushcare Major Day Out held 6 September at Bambara Corridor, Carlingford.
- Free guided bushwalks: over 370 people attended during the year.
- 60 volunteers planted over 750 trees and plants in Epping's Somerville Park enhancing the bushland corridor along Terry's Creek, augmenting the blue gum high forest that is native to the area and critically endangered.
- Two Local Land Services Grants and one Estuary Vegetation Grant currently being implemented for vegetation and riparian restoration at Terry's Creek, Byles Creek, Bar Island and Brooklyn Park.
- The sustainability program 'Dirt Girl World' has seen participation from half of the early childhood centres within Hornsby Shire. A Waste and Energy audit has also been offered to the centres as part of the program.



Photo: Fruiting body of fungi at Westleigh

## Performance measures (10 year Community Indicators)

(10 Year Community Indicators) Performance measures	Target / Trend	Latest Result	Trend (compared to 2013/14)
Area of bushland approved for development	No net loss of bushland	0.65 hectares (2014/15)  (this does not include revegetation of 4,136 sqm)	↓
Percentage of the Shire's waterways monitored, and proportion found to be healthy	50% of waterways classified as healthy	67% of monitored sites in Excellent or Very Good condition (2014/15)	~
Total community* water consumption and per capita consumption	12,660,131 kL Per capita per day = 208 L (2012/13)	14,025,763 kL Per capita per day = 228 L (2014/15)	↓
Percentage of Council's greenhouse gas emissions abated	30% reduction against 1995/96 levels by 2019/20	19.72% increase above 1995/96 levels (2014/15)  (significantly due to reopening of Hornsby Aquatic and Leisure Centre)	↓
Number of native plants distributed to the community and used in Council public land projects	44,265 (2012/13)	38,689 (2014/15)  (lower due to high plant demand/significant project in 2012/13 from Hornsby Aquatic and Leisure Centre)	~
Total water consumption at Council facilities	10% reduction against average 2007-2012 levels by 2021/22 (2022 goal = 124,585 kL)	171,752 kL (2014/15)	↓
Number of community members participating in Council's sustainability initiatives	1,315 (2012/13)	4,759 (2014/15)	↑

\* community water = units, houses, flats, industrial, commercial

## Service delivery indicators

(Annual) Service Delivery Indicators	2012/13	2013/14	2014/15
Area of bushland actively managed to restore native vegetation	12%	12%	12%
Volume of gross pollutants captured and removed from the Shire's waterways	1,191 metres <sup>3</sup>	1,062 metres <sup>3</sup>	966 metres <sup>3</sup>
Council's greenhouse gas emissions - tonnes CO <sub>2</sub> created at Council's top three sites	1,614 tonnes	1,353 tonnes	2,756 tonnes (due to reopening of Hornsby Aquatic and Leisure Centre)
Council's water consumption	152,188 kL	192,217 kL	200,882 kL



Photo: Commercial fishing vessels at Brooklyn

## Actions under Threatened Species Conservation Act 1995

### Actions taken to implement recovery plans

#### *Darwinia biflora*

To offset the loss of threatened plant *Darwinia biflora* due to the development of the Lindfield campus of The University of Technology Sydney (UTS), now under the management of Defence Housing Australia, an agreement has been signed whereby Council is undertaking management actions to protect the plant species in perpetuity at two other *Darwinia biflora* sites. These two sites are: Berry Park, Mount Colah (owned by Council) and Ern Holmes Oval, North Epping (Crown Reserve). The agreement was signed by Council's General Manager in August 2010.

The Department of Sustainability, Environment, Water, Population and Communities granted consent to the proposed development and provided conditions of approval. Condition 2 required the placement of restrictive covenants on the lands to provide surety that the lands would remain for conservation purposes thus protecting the plant species. During 2014/15 Council assisted in the implementation of the management plans in accordance with Condition 3 of the approval.

Berry Park and Ern Holmes Oval are both identified in the NSW Draft *Darwinia Biflora* Recovery Plan.

#### *Eastern Pygmy-possum*

The Priority Action Statement for the Eastern Pygmy-possum (*Cercartetus nanus*) identifies the need to conduct field surveys to delineate distribution and key populations.

With assistance from State Forests and Aquila Ecological Services, the survey of Eastern Pygmy-possum continues at 11 sites between Laughtondale and Mount Kuring-gai, where nest boxes are checked weekly. The species has been recorded at five sites including Berowra, Maroota, Cowan, Mount Kuring-gai and Berrilee.

The program will continue in 2015/16 and will incorporate the use of other remote sensing techniques including infrared camera and song meter.

#### *Giant Burrowing Frog*

Another threatened species that shares a similar habitat to the Eastern Pygmy-possum is the Giant Burrowing Frog.

During 2014/15 Council engaged renowned frog expert Dr. Frank Lemkert (Niche Environmental) in conjunction with Dr Marion Anstis (national tadpole expert) to undertake surveys and habitat assessment for the threatened Giant Burrowing Frog. It is envisaged that this information will provide assistance in determining the impacts of development and bushfire hazard reduction regimes.

This species will also be targeted as part of the 2015/16 remote sensing program.

## Planning agreements

There were three Voluntary Planning Agreements executed during the year:

1. DA/1370/2013 - 21-39 Waitara Avenue and 20-30 Orara Street, Waitara - executed 9 October 2014 - Dedication of land zoned RE1 Public Recreation under Hornsby Local Environmental Plan 2013 and known as property nos. 26, 28 and 30 Orara Street, Waitara and 39 Waitara Avenue, Waitara at no cost to Council for future use as a local park
2. DA/1398/2011 - 12 & 12B Surrey Street, Epping (subdivision) - executed 22 November 2014 - Green offset in the amount of \$69,722.40 for removal of Sydney Turpentine Ironbark Forest (STIF)
3. DA/1394/2013 - 186 Beecroft Road, Cheltenham (subdivision) - executed 20 June 2015 - Green offset in the amount of \$19,505 for removal of Sydney Turpentine Ironbark Forest (STIF).



Photo: Ern Holmes Oval – *Darwinia biflora* offset site

## State of the environment

Council's report as to the State of the Environment reflects its commitment to leadership in sustainability and environmental management.

### Greenhouse gas emissions and reductions

tonnes CO <sub>2</sub> created by Council			
Council's top three sites	2012/13	2013/14	2014/15
Hornsby Aquatic and Leisure Centre	<i>Facility closed</i>	<i>Facility closed</i>	1,717
Council's Administration Centre	815	656	655
Hornsby Library	473	408	384
Galston Aquatic Centre	326	289	(320)
TOTAL	1,614	1,353	2,756

#### How are we going?

This year's result is significantly higher due to the reopening of the Hornsby Aquatic and Leisure Centre in August 2014. Council continues working towards achieving its carbon reduction targets by actively implementing technologies and behaviours to increase energy efficiency and renewable energy production. This work includes a major LED lighting retrofit that has been implemented in five significant buildings, and more than 120 kilowatts of solar panels installed at Hornsby Library, Epping Library and Wallarobba Arts and Cultural Centre during the year.

### Council's water consumption

Year	kL
2009/10	151,025
2010/11	145,981
2011/12	107,553
2012/13	152,188
2013/14	192,217
2014/15	171,752

#### How are we going?

As at 2012/13, Council's water consumption decreased by 10% compared to the preceding ten year average (168,350kL). In contrast a 29% increase was recorded compared to 2011/12. Rainfall recorded in 2011 was the highest since 1999. Council's water consumption has continued to increase, rising 12% from 2012/13 to 2014/15. Generally water consumption trends have been influenced by water reuse, water conservation/efficiency programs, water losses from an ageing infrastructure, maintenance of assets and lower rainfall.

### Bushcare

	2012/13	2013/14	2014/15
Number Bushcare volunteers	780	898	608
Total volunteer Bushcare hours	17,500	18,500	12,500
Total area Bushcare sites	76.2ha	77ha	77ha

#### How are we going?

Council's Bushcare program was established in 1998. The program remains the largest volunteer program in the Shire and one of the largest Bushcare programs in the Sydney metropolitan area with 101 registered groups and 608 registered volunteers. Volunteer hours during the period were 12,500, with an estimated value of \$375,000. This year the Bushcare volunteers restored and enhanced 77 ha of native vegetation and habitat in Council's bushland reserves across the Shire. Twenty three of the groups were involved in enhancing over 15.5 ha of five unique endangered ecological communities including Blue Gum Shale and Diatreme Forest, Turpentine Ironbark Forest and Duffys Forest. The Bushcare team provided a number of initiatives, including a variety of seminars, talks, tours and training, to members of the Bushcare volunteer program and to the wider community. These initiatives included involvement in the Healthy Living Festival, hosting a *Mushroom Evening*, and the popular Bushcare Christmas Party, photograph exhibition and calendar.

### Community Nursery

Native plants are provided to the Bushcare sites, plant giveaway days for ratepayers, Citizenship ceremonies, schools and community groups, and a variety of environmental workshops, events and activities across the Shire including National Tree Day.

The Nursery provides locally collected provenance stock to bushland restoration projects, such as catchments remediation, land rehabilitation and landscape works. All seed is locally collected to maintain genetic integrity.

The Nursery has held accreditation with the Nursery Industry Accreditation Scheme Australia (NIASA) since 2005, the only accredited council nursery in NSW.

	2012/13	2013/14	2014/15
Nursery volunteers	40	43	47
Total community nursery volunteer hours	2,723	3,005	3,200
Tubestock produced	52,458	43,532	38,400
Tubestock despatched	44,235	40,217	38,689
Free Plant Giveaway Days	4	4	4
Tubestock despatched to ratepayers	5,773	6,645	6,143
Ratepayers receiving tubestock	2,300	1,285	955

## Bushfire hazard reduction

	2012/13	2013/14	2014/15
Number of sites of hazard reduction burns*	15	10	12
Area burnt*	512 ha	1,591 ha	746 ha

### *How are we going?*

#### Hazard reduction burns on Council land

Climatic windows, environmental constraints and resourcing issues have limited the possibility of completing all scheduled Hazard Reduction Burns during 2014/15. All proposed hazard reduction burns proposed on Council lands have been appropriately prepared. Combined, Land Managers completed 12 hazard reduction burns within the Hornsby Shire:

- Short Street, Forest Glen (84 ha protecting 50 assets)
- Canoelands (92 ha protecting 30 assets)
- Berowra West (12 ha protecting 71 assets)
- Smugglers Ridge (Marramarra National Park, Fiddletown) (457 ha protecting five major assets)
- Forest Glen (6 ha protecting 6 assets)
- Burke Place, Mount Colah (3 ha protecting 50 assets)
- Berowra Valley National Park, Hornsby Heights (NPWS – 80 ha protecting 210 assets)
- Bujwa Creek (Muogamarra National Park, Cowan) (NPWS – 5 ha protecting one major asset)
- Cumbora Circuit, Berowra (1 ha protecting 24 assets)
- Lonsdale Avenue, Berowra Heights (5 ha protecting 30 assets)
- Beaumont Road, Mount Kuring-gai (0.4 ha protecting 1 major asset)
- Pacific Highway, Cowan (0.3 ha protecting three major assets).

#### Manual hazard reduction activities

Works identified in the Hornsby Shire Council Bushfire Risk Mitigation Manual Works Program 2010-2015 were carried out by Council contractors. Manual works were scheduled and undertaken with assistance of grant funding from the Bushfire Mitigation Fund:

Treatment of 31 Asset Protection and 10 Works Access Lines were maintained, covering a total area of over five hectares and affording protection to over 220 properties immediately adjoining Council bushland.

#### Burning on private land

847 'Approval to pile burn' permits were issued under the Protection of Environment Operations (Clean Air) Regulation 2010. There were 10 inspections from complaints about illegal burning during the year.

#### Fire trail works

There are over 21km of fire trails that Hornsby Council manages and maintains and on which works are scheduled as part of the Bushfire Risk Management Plan.

Scheduled inspections have occurred on all Council managed fire trails and significant surface works were conducted on Ginger Meggs Fire Trail and Clovelly Fire Trail.

#### Bushfire Management Committee (BFMC) activities

Council has been heavily involved with the production and completion of an updated Fire Trail Register which will be used for the Hornsby Ku-ring-gai BFMC area. A review is currently being undertaken in conjunction with all land managers on the Risk Management Plan which will detail bushfire management works (manual hazard reduction, fire trail maintenance and community education) for the next five years. This review is expected to be completed by late 2015.

The Natural Resources Branch worked closely with the BFMC, in particular the NSW Rural Fire Service (RFS) and Fire & Rescue NSW, in all aspects of bushfire management to ensure optimum bushfire mitigation outcomes for the communities of the Shire

#### Community education

Council conducted four community events with the Bushfire Education trailer, helping residents with their Bushfire Survival Plans. Events were held at Clovelly Road and Arrionga Place, Hornsby; Begonia Road, Thornleigh; and Judith Avenue, Mount Colah with the NSW Rural Fire Service and Fire & Rescue NSW. Over 80 residents were assisted with bushfire awareness at these activities.

#### **Stormwater quality improvement devices**

	2012/13	2013/14	2014/15
Total number of Stormwater Quality Improvement Devices (SQIDs)	436	438	443
Waste removed from SQIDs	1,191 tn	1,062 tn	1,173 tn
Cost of constructing SQIDs	\$900,000	\$1,016,000	\$878,000
Cost of maintaining SQIDs	\$381,000	\$420,000	\$430,000*

\*\$203,000 cleaning of SQIDs, \$227,000 bush regeneration/landscape maintenance

### *How are we going?*

Council has continued to construct and maintain special devices to improve the water quality of the Shire's stormwater and waterways.

# Bushland and Biodiversity

Hornsby Shire covers 50,874 hectares of which approximately 67% is bushland. Council manages 278 natural areas (bushland and wetlands). Other functions include on ground bush restoration and regeneration; upgrade and maintenance of walking tracks, providing free guided bushwalks and the Hornsby Mountain Bike Trail; management of a large volunteer Bushcare Program; management of bushfire risk in reserves and actively participating in bushfire risk management in the Shire; providing assessment and advice on large areas of private bushland. These activities are guided by legislation, the adopted Biodiversity Conservation Strategy, Plans of Management and other strategies adopted by Council. The Branch undertakes specific management roles in Berowra Valley National Park. The more significant bushland reserves are:

Arcadia: Arcadia Park, Calabash Road Bushland, Calabash Point Bushland, Halls Creek Bushland

Asquith: Michigan Avenue Bushland, Mills Avenue Bushland

Beecroft: Beecroft Reserve, Byles Creek, Chilworth Reserve, Castle Howard Bushland, Edwards and Lamorna Bushland, Fearnley Park, Observatory Park

Berowra: Berowra Community Centre Bushland, Combora Circuit Bushland, Evanda Street Bushland

Berowra Creek: Bar Island, Neverfail Bay Bushland

Berowra Heights: Berowra Park, Cunio Point Bushland, Turner Road Bushland

Berowra Waters: Furber Park

Berrilee: Bay Road Bushland, The Woolwash

Brooklyn: Brooklyn Park, Brooklyn Railway Bushland, McKell Park, Seymours Creek Bushland

Canoelands: Pumpkin Point Creek Bushland

Carlingford: Ray Park

Castle Hill: Upper Pyes Creek Bushland

Cheltenham: Cheltenham Bushland

Cherrybrook: Kanangra Crescent Bushland, Lakes of Cherrybrook, Pyes Creek Bushland

Dangar Island: Kiparra Park

Dural: Muraban Road Bushland, Pyes Creek Bushland

Epping: Dence Park, Midson & Plympton Road Bushland, Terrys Creek Bushland, Vimiera Park

Fiddletown: Bloodwood Road Aboriginal Area, Calabash Point Bushland, Collingridge Bushland, Sunnyridge Road Bushland

Galston: Fagan Park (including Carrs Bush), Galston Park, Galston Recreation Reserve and Hayes Park, Knights Road Bushland

Glenorie: Campbell Crescent Bushland, Glenorie Park

Hornsby: Florence Cotton Reserve, Hornsby Park, Manor Road Bushland, Reddy Park, Rosemead Road Bushland, Waitara Creek Bushland

Hornsby Heights: Crosslands, Ginger Meggs Park, Rofe Park Bushland, Somerville Road Bushland

Laughtondale: One Tree Reach Wetland

Maroota: Molesworth Reserve, Wisemans Ferry Lookout Bushland, Wisemans Ferry Tip (decommissioned – bushland parcel)

Middle Dural: Forsters Reserve

Mount Colah: Berry Park Bushland, Bimbil Avenue, Excelsior Bushland, Judith Ave Bushland, Murralong Road Bushland, Oxley Drive Park, Sue Place

Mount Ku-ring-gai: Mount Ku-ring-gai Park

Pennant Hills: Azalea Grove Bushland, Britannia Street Bushland, Observatory Park, Tristania Way Bushland

Normanhurst: Begonia Road South Bushland, Kenley Park, Normanhurst Park, Pine Street Bushland, Waitara Creek Bushland

North Epping: North Epping Oval, Woods Street Oval

Thornleigh: Dog Pound Creek Bushland, Larool Crescent Childrens Centre (bushland parcel), Larool Creek Bushland

Westleigh: Dog Pound Creek Bushland, Quarter Sessions Road Bushland, Western Crescent Playground (bushland parcel)

West Pennant Hills: New Farm Road Bushland

Wisemans Ferry: Singleton Mill Road Bushland and Wisemans Ferry Cemetery (bushland parcel)

## Biodiversity Conservation Strategy

The **Hornsby Shire Biodiversity Conservation Strategy** (2004, updated 2006) guides Council's priorities for undertaking conservation actions. Its objectives are to:

- *Conserve* species, populations and communities of native plants and animals, and allow for their continued evolution and survival in the Hornsby Shire in context of the region.
- Achieve an *improvement* in the quality and extent of existing indigenous vegetation in Hornsby Shire.
- Collect and update biodiversity conservation *information*.
- Develop key community incentive and *partnership* programs to maintain biodiversity on private properties in the Hornsby Shire.
- Ensure Council activities *integrate* with other agencies to achieve biodiversity conservation outcomes.

- Ensure environmental *planning* instruments and processes provide a strategic approach to achieving biodiversity conservation outcomes.
- Maintain and improve the management of biodiversity on *publicly owned land* in Hornsby.
- Effectively *mitigate threats* to conserving biodiversity in Hornsby.
- Conserve and recreate *connectivity* across fragmented landscapes.
- Develop and implement effective *systems* to fund and manage biodiversity conservation actions.

Hornsby Shire has over 1,000 native plants and 388 terrestrial vertebrate animals. Of these, there are 26 threatened plants and 42 threatened fauna known or likely to occur.



Photo: Nursery volunteers



## Annually ten high priority actions are implemented from the Biodiversity Conservation Strategy

### Major achievements and issues for 2014-15 included:

**Conservation** – Council is to accept transfer of 29 lots of bushland (74ha) in Epping, Beecroft, Galston and Cowan.

**Bushland restoration** – 204 ha or 15.7% of Council bushland, a 9% increase from last year-

**Contract bush regeneration** restored 145 ha in 68 reserves a 14%, through Council and grant funds, an increase in the area regenerated in 2014-15.

**Catchment remediation vegetation** - maintenance of native vegetation landscaped zones at 18 sites was a 13% increase from last year.

**608 Bushcare volunteers** restored 77 ha at 101 sites, with 111 new members joining.

**Community nursery propagated** 38,438 tube stock plants for restoration. 6,143 free native plants were provided to 954 properties at 4 open days promoting biodiversity in local gardens. 38,689 plants were supplied for the Catchment Remediation Rate program, National Tree Day, Council bushland and Bushcare sites, advanced street trees, landscape projects and schools.

**Knowledge** - Eastern Pygmy Possum ongoing monitoring assisted in adapting to Climate Change. A 10/50 tree canopy loss study was commenced.

### Partnerships -

**Bushcare volunteers worked** in Council bushland for 12,500 hours valued at \$437,500.

**47 Nursery volunteers** did 3,229 hours of plant production, a 7% increase from last year valued at over \$113,015.

**Guided bushwalks** 378 residents attended 30 free walks

**Rural community** 3 workshops were delivered on advanced horse property management (2) and native grasses (with Still Creek Landcare Group)

**Floating Landcare** 7 events at Bar Island had 58 volunteers undertaking 348 hours of bushland restoration with Bushcare volunteers and LLS.

**Hornsby Mountain Bike Trailcare Program** – 106 registered volunteers in program, attended 6 work days and contributed 173 hours valued at \$6055.

**Bushland Management Advisory Committee** – community representatives met 4 times and inspected 4 sites.

**1116 community members** attended displays, stalls, seminars, tours, talks and training, an 87% increase in attendance.

**Integration with agencies - Berowra Valley Working Group** - Council managed Bushcare and bush regeneration contracts in Berowra Valley National Park and worked with NPWS.

### Planning -

- Significant tree canopy loss following the introduction of 10/50 vegetation clearing legislation. Council made submissions to the Rural Fire Service and held a public meeting.
- Three offsets valued at \$136,279 were negotiated to offset the loss of Blue Gum High Forest and Turpentine Ironbark Forest.
- Second Biobank site negotiated at Dog Pound Creek.

### Minimised threats to native flora and fauna -

**Development Applications** - 242 DAs and Tree Applications were assessed with over 100 additional formal responses to developments, assessments and breaches.

**Environmental impact assessments** - 7 EIAs were prepared for Council projects and assessed 10 EIA including 2 major infrastructure projects.

### Noxious Weeds -

- 1226 property inspections
- 32 km of weed pathways inspected
- 133 'seek cooperation' to control noxious weed letters/ notices issued
- 1 Section 64 Certificates issued
- Tussock Paspalum, African Olive, Pampas Grass and Boneseed controlled on public land

### Bushland recreation

- Hornsby Mountain Bike Trail was used for 2 club events and user numbers average 3,300 per month or 39,500 per annum.
- Upgrades of 3 tracks -Reddy Park, Blue Gum Track and Callicoma Track
- 12 tracks over 49 kms in length with interpretive signs were audited and maintained

### **Bushfire mitigation** undertaken -

- 41 Asset Protection Zones and Works Access Lines maintained over 5 ha protection 220 houses
- Bushfire Education – 4 events were held with 80 residents
- \$10,709 grant for asset protection
- 92 km of Council Fire Trails maintained
  - 2 Fire Trails had vegetation and surface maintenance.
  - 4 Fire Trails upgraded.
- 10 Burns prepared on Council land
- 10 Hazard Reduction burns completed
- 12 burns in Hornsby Local Government Area
- 847 permits to burn issued for private land a 33% increase since last year
- 4 hazard complaints addressed
- Introduction of 10/50 vegetation clearing legislation for fire management in August 2014.

### **Connectivity –**

**Roadside vegetation:** Council maintained 11 sites of remnant and endangered vegetation that forms habitat links.

**Riparian and estuarine vegetation:** 0.7 ha was restored at Brooklyn Park and the foreshore of Bar Island and Fishermans Point through grant funding.

**Habitat Connectivity and Rural Lands Incentives Programs:** 1.5 ha of private bushland was restored at Cherrybrook Technical High School, Benedictine Monastery at Arcadia and Marymount Mercy College, Castle Hill.

**Funding** - Achieving additional income and commitments of \$4,337,931 to achieve bushland management, restoration and enhanced recreational experience of Hornsby Shire's bushland.

**Revegetated** 4,136 sqm (4,370 in 2013/14) compared to 3,222 sqm (10,868 in 2013/14) lost to development being a net increase of 914 sqm – this excludes 10/50 clearing and unauthorised clearing.



Photo: *Corybas* and *Cryptostylis* orchids in an urban bushland reserve

# Catchment Remediation

This report aims to provide both quantitative and qualitative commentary on a number of programs run as part of the Catchments Remediation Program, funded by the Catchment Remediation Rate and identified in the Sustainable Total Water Cycle Management Strategy. These programs include the water quality treatment and stormwater harvesting capital works, asset maintenance and monitoring, asset renewal, landfill and leachate remediation, street sweeping and catchment education. The primary focus of the report is to provide quantitative data and analysis of the relative performance of different water quality treatment measures, including gross pollutant devices (GPD's), sediment basins, wetlands and biofilters that have been constructed to improve stormwater quality in Hornsby Shire. The results of the report will be used by stormwater and catchment managers to provide a better insight into determining the type of structures that are suitable for specific sites. Furthermore, the data provides valuable information about the costs (both capital and maintenance), benefits and device optimisation which can aid in the formulation of strategies to improve catchment and landuse practices by both structural and non-structural means.

Gross pollutant devices, sediment basins, wetlands and biofilters all come under the general description of Stormwater Quality Improvement Devices (SQUIDs). The principal objective of installing SQUIDs is to improve water quality by removing pollutants and in some instances retaining stormwater flows. In the 2014 - 2015 financial year, \$878,000 was spent on capital works with 6 new catchments remediation projects being initiated and completed, including two major upgrades of existing assets. These works involved the construction and/or installation of:

- Four end-of-pipe biofilters: Pennant Hills, Epping, Cherrybrook (x2).
- Two vault installations: Hornsby Pool (installed by Infrastructure & Recreation Division) and Mount Colah;
- Installation of a Biofilter/Stormwater Harvesting System: Dural;
- 9,761 native plants at new and existing sites to replace and outcompete weeds and help facilitate the process of water quality treatment

Additionally, the following works were also carried out on existing sites that involved either upgrading their water quality treatment and pollutant removal, instigating repair works or sediment removal:

- Upgrade of Community Nursery water reuse system, Pennant Hills;
- Sediment removal from:
  - Hull Road, Beecroft;
  - Malton Road, Beecroft;
  - Blantyre Close, Thornleigh;
  - Castle Howard Road, Cheltenham;
  - Denman Parade, Normanhurst;
  - Larool Crescent, Thornleigh; and
  - Duneba Drive, Westleigh x 4 sediment basins.

While these repair and maintenance works treat and remove pollutants directly, the Catchments Remediation Program also promotes and funds non-structural initiatives in the pursuit of improving water quality in the Shire's creeks, waterways and receiving waters. These include: monitoring, maintenance, street sweeping, riparian bush regeneration, environmental education, business auditing, compliance programs, pollution clean-ups and estuary management initiatives.

The collection of performance data over the 2014 - 2015 financial year has allowed Council to quantify the volume of gross pollutant (sediment, litter and organic matter) removal from Council's 443 water quality improvement assets. The data show that 1000 cubic metres of sediment, litter and organic matter collectively was captured and prevented from entering the Shire's waterways during this period.

The total cost to Council to maintain its water quality improvement devices and adjacent landscaped areas was approximately \$430,000 in the 2014- 2015 financial year. This included \$203,000 for the cleaning of SQUIDS and disposal of waste and \$227,000 for landscaping maintenance and bush regeneration at the sites. Other associated costs included the monitoring and maintenance of leachate treatment facilities, tree work and staff wages.

Overall, the findings of this report give stormwater managers a better insight into the cost-effectiveness and performance of water quality improvement structures and the management of life-cycle costs for individual stormwater treatment measures. The performance of these devices allows Council to both refine and modify the design of future water quality control measures and judge their appropriateness for proposed remediation sites based on catchment size and land use impact.

# Water Quality

- Hornsby Shire Council established a water quality monitoring program in 1994 to assess, through time, the impact of land use on waterways within the Shire and to monitor the performance of Council's Catchments Remediation Rate (CRR) Program. The monitoring data is used for prioritising catchment remediation works, environmental assessments, catchment modelling and education programs. This data is available to the community and interested authorities upon request and presented within Annual Reports and on Council's website [www.hornsby.nsw.gov.au/water](http://www.hornsby.nsw.gov.au/water).

- During the 2014-15 reporting period water quality was routinely monitored at 65 sites across the Shire in both freshwater and estuarine locations to assess:

- Long term ecosystem health in estuarine and freshwater sites located below different land use types (urban, industrial, rural, bushland).
- Activities directly influencing water quality (e.g. wastewater treatment plants).
- Effectiveness of disused landfill leachate collection and treatment.
- Effectiveness of stormwater harvesting and reuse programs which reduce stormwater impacts and improve water conservation.

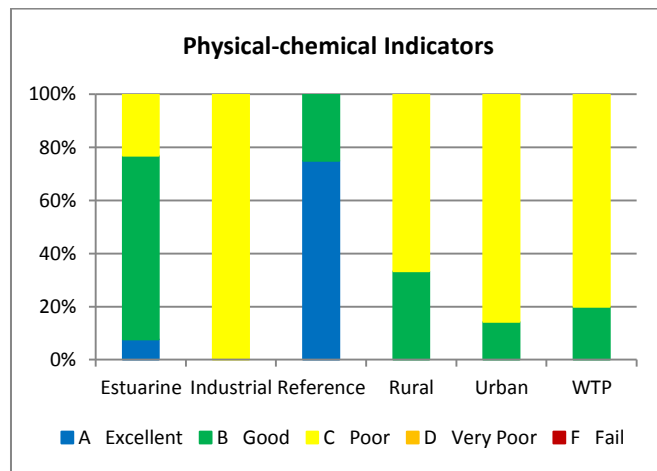
Routine water quality monitoring for aquatic ecosystem health showed the following results (**Error! Reference source not found.** and **Error! Reference source not found.**) between the 2013-14 and 2014-15 reporting periods:

- an improvement in the physical-chemical site health grades of two freshwater sites and one estuarine site
- a decline in the physical-chemical site health grades of two freshwater sites and two estuarine sites
- an improvement in the microbial site health grade of one freshwater site
- a decline in the microbial site health grades of fourteen freshwater sites and three estuarine sites.

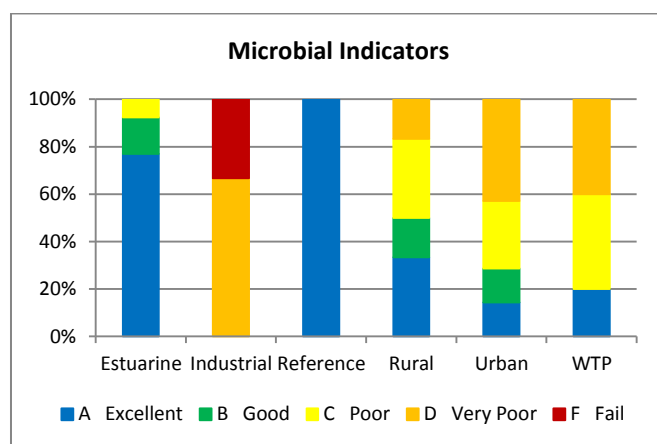
It is important to note that 2014-15 reporting period received significantly more rain fall than the previous year (~1400mm compared to ~680mm in 2013-14), resulting in more pressure from catchment inputs.

The general trend for water quality in Hornsby Shire (Figure 1 and Figure 2), as evident from monitoring through time, is that better water quality results are recorded where catchments remain primarily undisturbed (reference sites), this is usually in National Parks and Nature Reserves. Results generally decline downstream of rural and urban settlements, with most impacted water quality being recorded downstream of industrial areas.

Water quality in estuarine areas is generally good due to constant tidal flushing. The upper sections of Marramarra and Berowra Creeks, where less tidal flushing occurs, show signs of impacts from the catchments.



• Figure 1 Percentage of site health grades for physical-chemical indicators within each catchment land use



• Figure 2 Percentage of site health grades for microbial indicators within each catchment land use

Stormwater harvesting and reuse systems have been operating well since the implementation of a preventative maintenance system in late 2013. Further investigation into the amount of potable water in the systems at Epping, North Epping and Greenway Ovals is recommended. Levels of bacteria are low (below trigger values) in all treated stormwater being applied to playing ovals through irrigation.

Site No.	Location	Category	2012/2013		2013/2014		2014/2015	
			Phys-Chem	Microbial	Phys-Chem	Microbial	Phys-Chem	Microbial
001	Berowra Ck	WTP	D	A+	C	A+	C	C ↓
002	Tunks Ck	Rural	B	A+	A	A+	B ↓	A+
004	Berowra Ck	Urban	C	A	C	A	C	C ↓
005	Berowra Ck	Urban	D	A	C	A	C	D ↓
006	Georges Ck	Urban	C	A	C	A	C	B ↓
008	Devlins Ck	Urban	D	D	C	B	C	D ↓
010	Larool Ck	Industrial	D	F	D	D	C ↑	D
012	Hornsby Ck	Industrial	D	F	C	F	C	F
013	Sams Ck	Industrial	D	D	C	A	C	D ↓
023	Waitara Ck	WTP	D	C	C	C	C	D ↓
036	Murray Anderson Ck	Reference	A	A+	A	A+	A	A+
037	Smugglers Ck	Reference	A	A+	A	A+	A	A+
039	Joe Crafts Ck	Urban	A	A+	B	A+	B	A
042	Colah Ck	Rural	C	A	C	A	C	C ↓
043	Calna Ck	WTP	C	A+	C	A+	C	A+
045	Berowra Ck	WTP	C	B	C	B	C	C ↓
046	Trib Terrys Ck	Urban	D	F	C	C	C	D ↓
049	Still Ck	Rural	C	A	B	A+	C ↓	B ↓
052	Calna Ck	WTP	B	D	B	A	B	D ↓
054	Laughtondale Ck	Reference	A	A+	A	A+	A	A
062	Kimmerikong Ck	Rural	D	B	C	A	C	C ↓
063	Colah Ck	Rural	C	A+	B	A	B	A
064	Trib. Colah Ck	Urban	D	B	C	B	C	C ↓
080	Glenorie Ck	Rural	D	F	D	F	C ↑	D ↑
114	Muogomarra Ck	Reference	B	A+	A	A+	A	A+
123	Peats Crater Ck	Reference	B	A	B	A+	B	A
147	Trib. Byles Ck	Reference	A	A+	A	A+	A	A
149	Duckpond Ridge Ck	Reference	B	A+	B	A+	B	A+
164	Djarra Crossing	Reference	A	A	A	A+	A	A

Comparison of site health grades for freshwater aquatic ecosystem health sites between the last three reporting periods. Results for 2014-15 also indicate whether the site health grade has improved or decline since the 2013-14 reporting period

Site No.	Location	Phys-Chem	Microbial	Aquatic Biota	Waterway Health Grade
038	Sandbrook Inlet	B	A	C	B
048	Marramarra Ck	C	B	C	C
055	Brooklyn Baths	B	A	A	A
060	Berowra Ferry	B	B	C	B
061	Calabash Bay	B	A	D	B
100	Crosslands Reserve	C	C	A	B
103	Milsons Passage	B	A	A	A
108	Bradleys Beach, Dangar Island	B	A	A	A
150	Gunya Point	A	A	A	A
151	Bar Island	B	A	C	B
152	Courangra Point	B	A	B	B
153	Laughtondale	C	A	C	B
174	Mullet Ck	B	A	B	B

Site Health Grades and subsequent Waterway Health Grades for estuarine sites during the 2014-15 reporting period

# Estuary

The Hawkesbury Estuary Program (HEP) is managed by the Natural Resources Branch within Council's Environment and Human Services Division. The program is implemented by both Hornsby Shire and Gosford City Councils, encompassing the estuarine reaches of the lower Hawkesbury River from Wisemans Ferry to Broken Bay. Successful implementation of the HEP requires frequent assistance from other Council divisions in particular Infrastructure and Recreation, and Planning.

Hornsby Shire Council's HEP provides an integrated and strategic approach to the management of estuarine assets in the lower Hawkesbury. This is achieved through the implementation of strategies contained within the Lower Hawkesbury Estuary Management Plan (2008). This plan was adopted by both Hornsby Shire and Gosford City Councils in 2009 to ensure a consistent local government approach to estuary management within the lower Hawkesbury River. Implementation of the plan is overseen by the Lower Hawkesbury Estuary Management Committee. Projects implemented during 2014/15 (Table 1) have focused on improving swimming conditions and healthy waterways. Significant effort has been directed towards the foreshore clean-up program, environmental monitoring of the waterways, oyster research into the Pacific Oyster Mortality Syndrome (POMS), vegetation rehabilitation of estuarine reserves, and the protection of seagrass beds through the deployment of signs and education campaigns.

Key projects, to a value of \$255K, were implemented in 2014-15 (Table 2) in which funding support of \$74K, was received externally from the NSW State Government towards two projects: 1) the on-going monitoring of the Lower Hawkesbury estuarine health through real-time water quality probes and 2) the rehabilitation and management of the riparian zone in Brooklyn Park, Salt Pan Reserve and Bar Island. In addition, \$27,000 from Hornsby Shire Council's Catchment Remediation Program was allocated to support the Foreshore Clean4Shore Program that engaged more than 200 volunteers and removed over 6.5 tonnes of foreshore marine debris.

A number of funding applications have been secured for projects in 2014/15 which include a hydrological investigation of tidal regimes at One Tree Reach wetland to inform optimal weir management and enhancement of the wetland function in regards to vegetation, water quality and fish stocks. Funding has also been secured to continue the research on POMS in partnership with the University of Sydney to further understand the spatial distribution and random characteristics of the virus activity. This research will provide industry with tangible solutions to continue farming oysters in infected estuaries like the Hawkesbury River. Funding has also been secured for vegetation restoration work and community activities in Milsons Island and Passage, and Bar Island.

Three prestigious awards were received this year from NSW EPA, Landcare Australia and NSW Coastal Conference highlighting the significant outcomes achieved from programs like the Clean4Shore Program, Floating Landcare and the innovative autonomous real-time water quality monitoring network that Council manages to ensure safe swimming conditions and healthy waterways

Hawkesbury Estuary Program projects undertaken during 2014-15

Category	Project Description
<b>On-ground Works</b>	Foreshore Clean Up – "Clean4Shore"
	Foreshore Rehabilitation
	Floating Landcare
	Mangrove Watch at Marlows Creek
	Kangaroo Point Vessel Pump out Facility
<b>Compliance</b>	Riverside Settlements Onsite Wastewater
	Seagrass Beds Protection
<b>Planning</b>	Comprehensive Local Environment Plan
	NSW Boating Plans
	Commercial Fishers reform
<b>Research</b>	Tailor Stocks in the Hawkesbury
	Real-time water quality monitoring: <ul style="list-style-type: none"> <li>- Algal blooms</li> <li>- Swimming conditions</li> <li>- Estuarine health</li> <li>- Water Quality Monitoring</li> </ul>
	Pacific Oyster Mortality Syndrome
<b>Education</b>	Events: Brooklyn Spring Fair Fenwicks Marina Open day Guided Bushwalks Program
	Marine Discovery Talks
	Seagrass Education Campaign
	HawkesburyWatch Webportal



The following outputs were achieved in 2014-15 through the implementation of the Hawkesbury Estuary Program:

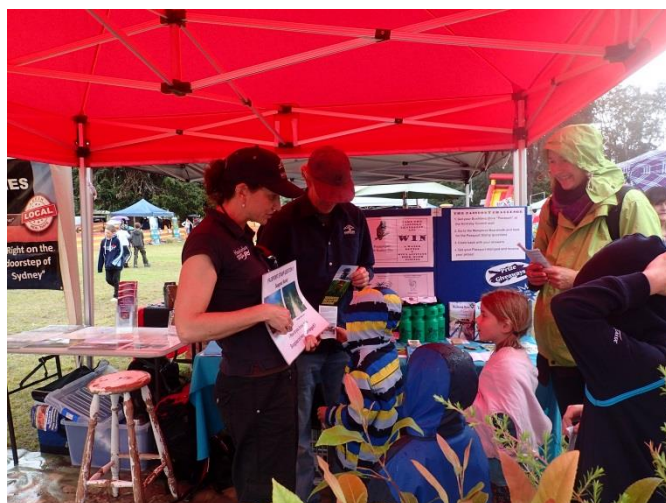
- 7.2 tonnes of marine debris was removed from the Lower Hawkesbury foreshore by 408 volunteers as part of the Clean4Shore Program and Floating Landcare. Plastic items are still an issue on marine debris accounting for 50% of the overall waste collected.
- A total of 3640hrs were invested in bush rehabilitation work targeting 3.1ha of coastal native vegetation and 9.5ha of terrestrial native vegetation. 1300 plants were planted around Brooklyn Park, McKell Park and Kangaroo Point. This work was undertaken by Council staff, contractors and Floating Landcare.
- Mangrove health monitoring program was undertaken during 2014/15 as a result of unexpected dieback of a small pocket of mangroves south of Marlows Creek.
- 16.3ha of seagrass beds keep being protected by aqua buoys and navigational markers to encourage good boating habits near seagrasses
- A seagrass education campaign continues from last year with the delivery of 600 brochures and 150 stickers, including public and school talks delivered to 112 school kids and 25 community members
- A total of 150 community members took part in Council's Guided bushwalks around the estuary
- 2 community events were attended and 2 catchment tours were organised at which education material was disseminated in regards to water quality, stormwater treatment and seagrass protection
- Design and installation of two state-of-the-art signs to promote Dangar Island's foreshore as key area for migratory birds stopover grounds
- 16 riverside settlement onsite wastewater system were inspected and 255,600L of effluent was collected via Council's boat pump-out at Kangaroo Point
- On-going water quality monitoring via autonomous real-time monitoring stations at 6 locations along the salinity gradient between Wisemans Ferry and the estuary entrance. Slightly higher than usual incidence of algal blooms were observed this year in Berowra Creek with no causative agent identified
- Overall estuarine health levels, as per OEH scores, ranged between 'Good' and 'Fair' throughout the year with improved levels during winter when overall turbidity levels are low and with worse scores during summer when chlorophyll-a levels tend to be higher
- Research partnership with UNSW looking at tailor stocks across different sites within the estuary and the role they play in the estuary food web
- HawkesburyWatch tools freely available to inform community members about algal bloom monitoring, swimming conditions, estuarine health levels and real-time water quality data. This tool won the 2015 NSW Coastal Innovation Award
- The Clean4Shore program partly funded by Hornsby and Gosford City Council was also the winner of the 'Hey Tosser' Litter Reduction Award' by the NSW Environment Protection Authority and winner of the 'Environmental Protection Award' at the 2014 Keep Australia Beautiful NSW Clean Beaches Award in

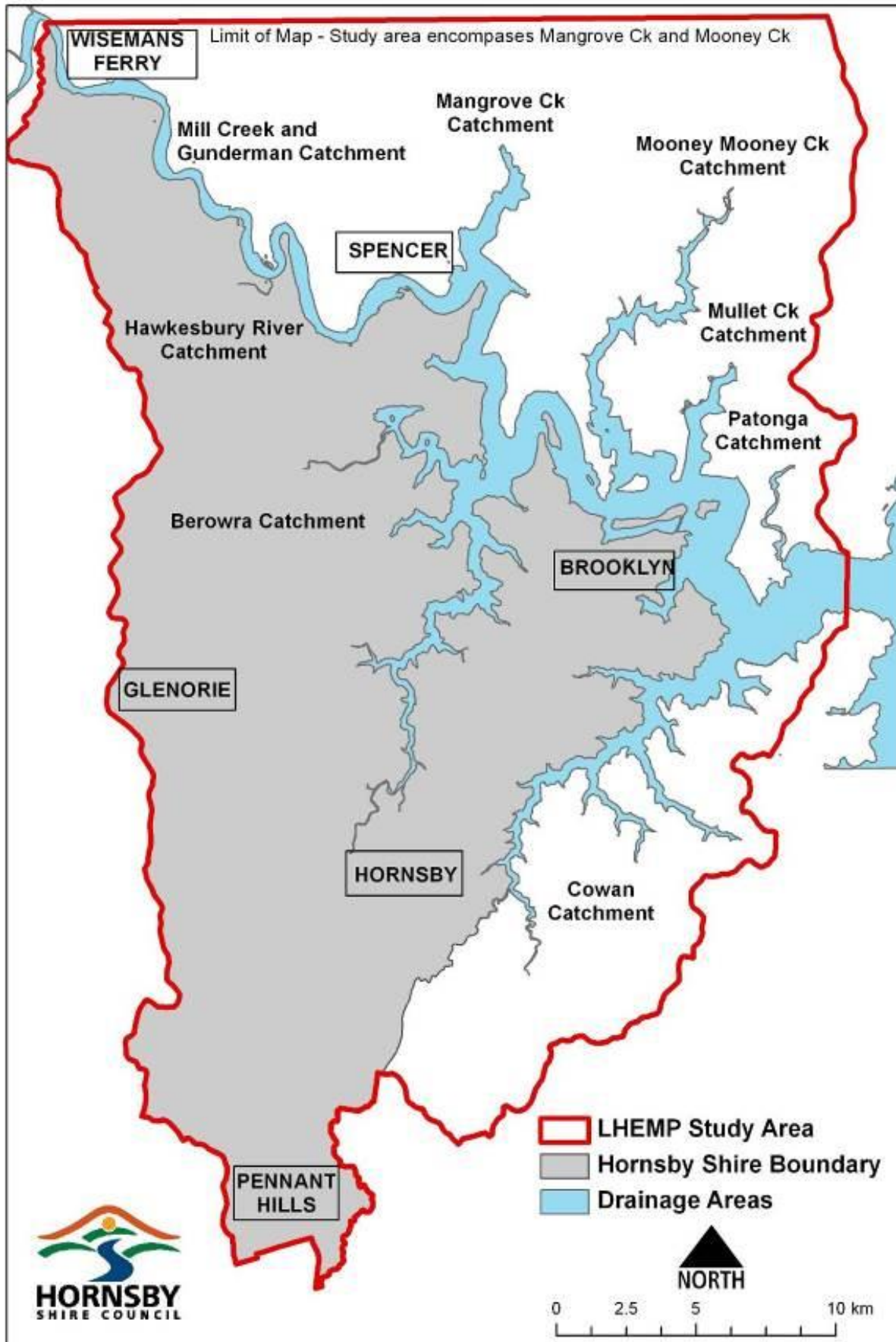
## partnership with Greater Sydney Local Land Services' Floating Landcare Program

Funding received for major projects in 2014/15 and secured funding for 2015/16

Organisation	Project Title	Funding
NSW Office of Environment and Heritage	Estuarine health monitoring of Hawkesbury's waterways	<b>\$50,000</b> (HSC match funding \$130k)
NSW Office of Environment and Heritage	Rehabilitation and management of riparian zones in Lower Hawkesbury Estuary	<b>\$24,000</b> (HSC match funding \$24K)
Hornsby Sire Council – Catchment Remediation and Waste programs	2015 Clean4Shore - Lower Hawkesbury Foreshore clean-up -	<b>\$27,000</b>
<b>Total External Funding:</b>		<b>\$74,000</b>
<b>Secured Funding for 2015/16 projects:</b>		
NSW Recreational Fishing Trust	One Tree Reach weir management investigation to improve water quality and fish habitat	
Fisheries Research Development Corporation & University of Sydney	Aquatic Animal Health Subprogram: POMS - closing knowledge gaps to continue farming <i>Crassostrea gigas</i> in Australia	
<i>Pending:</i> NSW Office of Environment and Heritage	A review of harmful microalgal to improve management and response to NSW blooms	

Media coverage for the 2014-15 year associated with the HEP has been included in Appendix 1 and 2. The media coverage in Council's estuary program acknowledges the community interest in the program, project innovation and timely deliverable of on-ground works.





Lower Hawkesbury Estuary Management Plan study area (red line)



## Environmental Sustainability

This section of the annual report summarises the achievements of the Environmental Sustainability team in 2014/15. These achievements have improved Council's resource use efficiency and contribute towards meeting Council's adopted greenhouse gas emission reduction target. Furthermore, implementation of environmental education activities has enabled the local community and local businesses to improve their environmental performance and reduce resource costs.

During 2014/15 Council managed over 300 facilities, 235 electricity accounts, 266 water accounts, 42 fuel accounts and 12 gas accounts. These facilities and utility accounts have been captured in Council's new carbon management reporting tool – Greensense. Greensense allows real time monitoring of energy, water and fuel consumption data and is assisting with leak detection at Epping Aquatic Centre, the Administration Centre, Berowra Pipeline and Galston

Aquatic Centre. Real time monitoring is also being undertaken on Council's renewable energy sites and allows for the quantification of generation rates of electricity from solar and wind power installations.

Council currently has 192.87 kW installed capacity of renewable energy generation across 18 solar installations and one wind turbine. These sites combined have produced 114,093.89kWh of electricity during 2014/15, saving Council approximately \$22,818<sup>1</sup>. To further improve our energy efficiency Council implemented a number of grant funded projects during 2014/15, including the installation of photovoltaic solar panels at the Wallarobba Arts and Cultural Facility (Beatrice Taylor Hall and Hornsby Learning and Leisure Centre), Hornsby Library and the Thornleigh Works Depot. LED lighting was also installed at Council's Administration building. Combined these projects will provide \$34,745.54 pa in avoided electricity costs. These projects are highlighted below.

### Energy Saving Measures installed by Council during 2014/15

Project / Facility	Completion	Capital Cost <sup>1</sup> (including GST)	Energy saved (kWh/pa)	\$ savings / pa	Payback Period (years)
Installation of LED tubes at Administration building carpark	13/7/14	\$8,594.30	24,437	\$4,887.40	1.75 years
Installation of 48 LED down lights – Administration Building Foyer	21/6/15	\$7,920	TBA	TBA	
Installation of 22 kW PV system at Willow Park Community Complex	October 2014	\$54,643.52	28,976.88	\$5,965.32	9 years
Installation of 78.1 PV system at Hornsby Library	February 2015	\$168,431	112,076	\$18,805.82	6.24 years
Installation of 21.73 PV system at Works Depot	20 April 2015	\$44,182.49	30,775	\$5,087	6.04 years
<b>TOTAL SAVINGS</b>		<b>\$283,771.31</b>	<b>196,264.88</b>	<b>\$34,745.54</b>	<b>8.16 yrs</b>

Reducing resource usage not only reduces the environmental impacts of Council operations, but also reduces the costs associated with resource consumption. In the 2014/15 financial year, over 4.5 million dollars was spent by Council on electricity, gas, street lighting and water. With utility costs likely to rise in the coming year, identifying and enabling opportunities to reduce resource usage is a key component of the Environmental Sustainability program.

During 2014/15 the Environmental Sustainability Team also implemented a number of sustainability events and workshops for the Hornsby Shire community, targeting specific themes and groups. In total 560 people were engaged in these workshops and activities (not including visitors to Council stalls at events) during the 2014/15 financial year. These workshops included energy and water audits with six preschools as part of the Dirt Girl Program, two Energy Saver workshops, two Backyard Chicken workshops, one Swimming Pools and Spas workshop and one Sustainable Architecture Talk.

To increase Council staff awareness of sustainability matters a workshop was held on how to be more energy efficient in their home. Professional development training was also undertaken with Council staff on Green Roofs and Walls, Water Sensitive Urban Design (WSUD) and Travel Plan to encourage greater implementation of sustainable practices within Council's Development Control Plans.

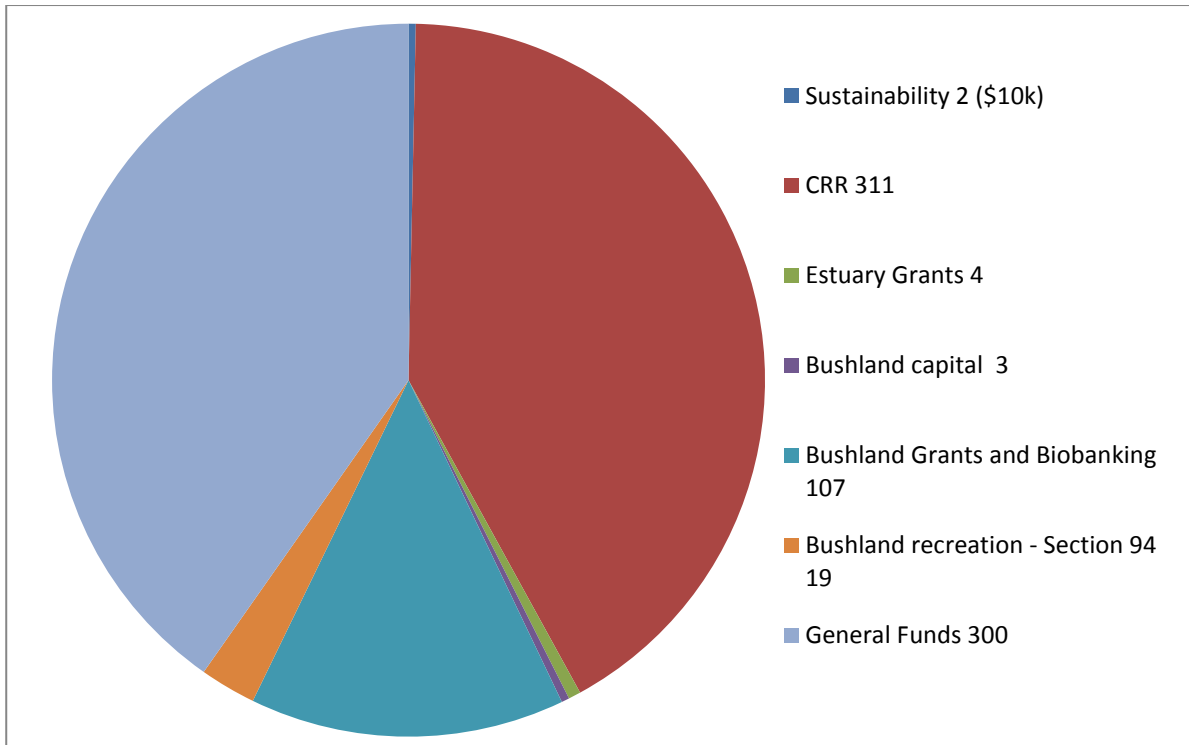


Hornsby Library photo voltaic cells



Willow Park photo voltaic cells

## Income



## Expenditure

