

5 Biodiversity

Biodiversity is the variety of all life forms - the different plants, animals and micro-organisms, the genes they contain and the ecosystems in which they live. Biodiversity underpins the ecological processes which make life on Earth possible, such as provision of fresh air, clean water, nutrients and pollination of plants. It provides medicines, fertile soils, food, as well as recreational opportunities and cultural identity.



Pressures on our Biodiversity

Key pressures include:

- altered and inappropriate fire regimes
- clearing and fragmentation of native bushland
- spread of weeds
- illegal poisoning of trees
- illegal dumping of rubbish
- predation by domestic and feral animals
- plant diseases such as Phytophthora
- stormwater /sewer discharges into bushland and waterways
- climate change impacts
- anchoring of boats, and
- replacement of swimming nets.

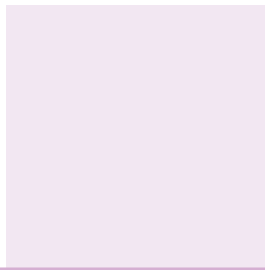
Condition of our Biodiversity

Biodiversity in the SHOROC region incorporates terrestrial, intertidal, and aquatic based plants, animals and micro-organisms and the ecosystems in which they live. The region is home to many threatened plants, animals and communities. Whilst most of this diversity is contained in the region's bushland areas and waterways, it is complemented by biodiversity in urban residential areas, including private gardens and street trees.

Regional Snapshot

Table 12: Regional Biodiversity Condition

| Indicator | SHOROC Region | | | | |
|---|---------------|--------|--------|--------|--------------|
| | 06/07 | 07/08 | 08/09 | 09/10 | 4 Year Trend |
| Total noxious weed notices to residents | 199 | 234 | 253 | 233 | ↑ |
| Total noxious weed assessments undertaken | 354 | 389 | 546 | 354 | ↔ |
| Bushcare program volunteer hours | 15,744 | 21,067 | 17,157 | 15,360 | ↓ |
| Total number of active registered Bushcare volunteers | 937 | 907 | 585 | 630 | ↓ |
| Number of threatened species (flora and fauna) | 167 | 167 | 183 | 194 | ↑ |



Local Snapshot

Table 13: Council Biodiversity Condition

| Indicator | Year | Council | | | |
|---|-------|-----------------|------------------|-------------------|-------------------|
| | | Manly | Mosman | Pittwater | Warringah |
| Noxious weed notices | 06/07 | 48 | 0 | 90 | 61 |
| | 07/08 | 83 | 0 | 56 | 95 |
| | 08/09 | 40 | 0 | 161 | 52 |
| | 09/10 | 36 | 0 | 167 | 30 |
| Noxious weed assessments undertaken | 06/07 | 0 | 25 | 177 | 152 |
| | 07/08 | 47 | 24 | 171 | 147 |
| | 08/09 | 80 | 9 | 170 | 287 |
| | 09/10 | 48 | 18 | 188 | 100 |
| Number of registered active Bushcare volunteers | 06/07 | 210 | 177 | 250 | 300 |
| | 07/08 | 66 [#] | 196 | 356 | 289 |
| | 08/09 | 86 [#] | 87 [#] | 181 ^{##} | 231 |
| | 09/10 | 26 ['] | 90 | 240 | 274 |
| Bushcare program volunteer hours | 06/07 | 583 | 2,754 | 6,207 | 6,200 |
| | 07/08 | 528 | 5,292 | 9,283 | 5,964 |
| | 08/09 | 598 | 2,054 | 7,220 | 7,285 |
| | 09/10 | 675 | 2,550 | 4,615 | 7,520 |
| Number of active Bushcare groups | 06/07 | 16 | 17 | 26 | 51 |
| | 07/08 | 11 | 34 | 28 | 51 |
| | 08/09 | 12 | 17 ^{##} | 37 | 51 |
| | 09/10 | 12 | 22 | 41 | 35 |
| Number of native plant species recorded in LGA | 06/07 | 449 | 454 | Unknown | 914 |
| | 07/08 | 449 | 454 | Unknown | 914 |
| | 08/09 | 449 | 454 | Unknown | 914 |
| | 09/10 | 449 | 454 | 285 | 929 ^{**} |

| Indicator | Year | Council | | | |
|---|-------|---------|--------|-----------|-----------|
| | | Manly | Mosman | Pittwater | Warringah |
| Number of threatened flora species | 06/07 | 10 | 3 | 14 | 20 |
| | 07/08 | 10 | 3 | 14 | 20 |
| | 08/09 | 10 | 3 | 21 | 20 |
| | 09/10 | 10 | 3 | 22 | 20 |
| Number of threatened fauna species | 06/07 | 20 | 4 | 42 | 54 |
| | 07/08 | 20 | 4 | 42 | 54 |
| | 08/09 | 20 | 4 | 46 | 59* |
| | 09/10 | 20 | 4 | 56 | 59 |
| Number of endangered ecological communities | 06/07 | 2 | 3 | 9 | 16 |
| | 07/08 | 2 | 3 | 9 | 16 |
| | 08/09 | 2 | 3 | 10 | 16 |
| | 09/10 | 2 | 3 | 11 | 16 |
| Number of endangered fauna populations | 06/07 | 2 | 0 | 2 | 0 |
| | 07/08 | 2 | 0 | 2 | 0 |
| | 08/09 | 2 | 0 | 2 | 0 |
| | 09/10 | 2 | 0 | 2 | 0 |
| Number of feral fauna species targeted through programs (e.g. rabbits, foxes, cats) | 06/07 | 2 | 2 | 3 | 6 |
| | 07/08 | 2 | 1 | 2 | 4 |
| | 08/09 | 1 | 1 | 2 | 3 |
| | 09/10 | 1 | 1 | 2 | 3 |

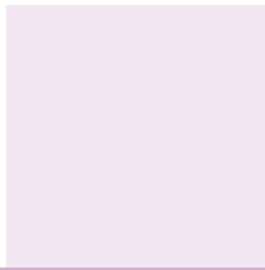
*In Mosman during 2008/09 there were 157 registered volunteers but only 87 of these were active. Previous years recorded the number of total registered volunteers, even if not active. Active volunteers have been recorded for Manly from 2007/08 to 2008/09 and during 2008/09 for Pittwater and Warringah. Previous years also included registered, non-active volunteers.

**Mosman has 7 informal individual Bushcare groups with 1 or 2 volunteers not formally supervised by Council, therefore not included in the figure for 2008/09. These informal groups were included in the figure for 2007/08 which explains the discrepancy in group numbers.

‘During 2009/10 a major overhaul of Manly Council’s volunteer database was conducted. Previous years data includes inactive volunteers as well.

**The total number of flora species recorded in Warringah increased by 15 this year from the 2005 inventory. The increase was recorded in the recent update of the Warringah Natural Area Survey – Vegetation Communities and Plant Species.

*The number of threatened fauna in Warringah increased in 2008/09 due to new determinations by the NSW Scientific Committee, as well as findings from the flora and fauna assessments and the first known reporting of a Bush-stone Curlew in 2008.



Responding to Biodiversity Issues

Regional Responses

National Tree Day

Tree planting makes a positive contribution to our environment by enhancing the local habitat, providing shelter for our native animals and helping to absorb carbon emissions. Each of the SHOROC member Councils participated in National Tree Day in July 2009. In Warringah, over 2,000 plants were planted at Greendale Creek by scouts, students and community volunteers. Manly Council held a planting event at Seaforth Oval, with approximately 55 people planting about 600 native plants to provide a buffer to the Duffys Forest Endangered Ecological Community. In Pittwater over 650 plants were planted by the community at Billarong Reserve. In Mosman over 600 native plants were planted by the community at Rosherville Reserve.

Urban Feral Animal Programs

During 2009/10, representatives from the SHOROC member Councils attended quarterly meetings of the Urban Feral Animal Action Group (UFAAG) to discuss and exchange information on feral animal issues across the region and possible solutions/ programs that could be implemented. The SHOROC member Councils continue to coordinate and implement ongoing feral animal monitoring and control programs. Priority species for the SHOROC region include european red foxes, rabbits, cats, Indian mynas and seagulls. Methods implemented during 2009/10 to control feral animals included trapping, biological control, shooting, education and baiting.



National Tree Day. Source: Pittwater Council

Delivering Local Responses

Manly Council

Duffys Forest Endangered Ecological Community Restoration

The restoration of Duffys Forest Endangered Ecological Community has been ongoing since the construction of a new access road into Seaforth Oval in 2009. Several initiatives have been undertaken to improve the condition of this important vegetation community. Soil translocation was undertaken to ensure the soil seed bank was protected, and has resulted in the successful regeneration of native plants. A vast array of species are appearing in this section, which is becoming the most species diverse section within this vegetation community. Tree planting has been undertaken to revegetate the degraded edge of this vegetation community to provide a buffer from weed incursions. In addition, protective fencing has been installed to minimise impact of people walking through the regenerating site.

Burnt Bridge Creek Restoration Project

Burnt Bridge Creek is one of three creeks entering Manly Lagoon. The creek has been subject to a range of impacts including poor water quality and bushland degradation. In 2008/09, Manly Council received \$1,997,570 from the NSW Government Environment Trust (Urban Sustainability – Major Projects Program), to fund a three year Integrated Restoration Project for the creek. The project represents an alliance partnership with Warringah Council.



Weed Infestation Eradicated Through The Burnt Bridge Creek Restoration Project. Source: Manly Council

The program is now in the second year. Expenditure of project funds is now underway to achieve six major environmental outcomes for the creek over a three year period. These include:

1. stormwater harvesting for Balgowlah Golf Course and Balgowlah Oval (providing an alternate water source for irrigation, increasing wet weather stormwater retention capacity of the sub- catchment and reducing dry weather dam extraction)
2. stormwater treatment for the Sydney Road Catchment (improving stormwater quality)
3. modification of the existing artificial Burnt Bridge Creek Weir to a sediment control basin with future truck maintenance access
4. removal of aquatic and riparian weeds
5. creek bank restoration along Burnt Bridge Creek, and
6. community engagement/education to protect Burnt Bridge Creek catchment values.

Progress in 2009/10 included:

- completion of the project Business Plan
- component 1 & 2: designs finalised, environmental assessment and approvals underway
- component 3: draft designs completed
- component 4: all contracts appointed, and work commenced.
- component 5: draft designs for all sites underway
- component 6: education strategy written and Catchment Education Officer to be appointed.

Threatened Species

Threatened populations of Little Penguins (*Eudyptula minor*) and Long-nosed Bandicoots (*Parameles nasuta*) are present in the Manly LGA. During 2009/10 Manly Council continued its active involvement in the Little Penguin Recovery Program in association with the DECCW and other stakeholders, through implementation of a variety of actions. For example the installation of an interpretive sign at West Esplanade to assist the volunteer penguin wardens with their ongoing community education. Council also continued to provide input into the development of the Long-nosed Bandicoot Draft Recovery Plan.

Mosman Council

Native Bogul Project

The Native Bogul Project is being undertaken by the University of New South Wales, the University of Sydney, and Taronga Zoo, with support from DECCW, Mosman Council and Rentokil. Mosman Council is providing in-kind and monetary support, and promotion of the project to the Mosman community. The project will provide information on the impacts of invasive black rats on native flora and fauna, remove black rats from Mosman bushland areas, re-establish a self-sustaining population of native bush rat (Bogul) in bushland areas, increase community awareness of biodiversity issues and restore the natural ecosystem. During 2009/10 black rat populations studies and trapping of the black rat began. The captive breeding program of the Bogul also commenced.

Biodiversity Factsheet

The Biodiversity Factsheet was completed in June 2010 and distributed to the Mosman community with the rates notice. The Biodiversity Factsheet was the fourth factsheet in the Sustainability 'Our Planet Our Future' Factsheet Series. The Factsheet included information on 'what is biodiversity?', 'threats to biodiversity', 'did you know facts about biodiversity', 'why should I take action', 'biodiversity in Mosman', 'actions I can implement to help conserve biodiversity', and useful website links. The Biodiversity Factsheet was distributed during 2010 to coincide with the International Year of Biodiversity.



Mosman Bushcare. Source: Mosman Council



Mosman Council Bushcare Program 2009/10

The Mosman Council Bushcare Program provides an opportunity for the community to work in partnership with council to improve Mosman's local environment. The Bushcare program fosters the aim of enhancing biodiversity and conserving native flora and fauna. In 2009/10, Mosman Council supported 22 Bushcare Groups and 14 individual volunteers. In addition trees were planted by members of the community on Trees for Mums Day at Beaconsfield Park, with a total of 120 participants planting 1200 native tube stock.

Bushcare Workshops/Events

Two annual events, the 'Weeds and Bush Friendly Gardens' Workshop and the 'Spit to Parriwi' bushwalk were undertaken in 2009/10, offering bushcare volunteers the opportunity to increase their skills and knowledge of local environmental issues.

To celebrate the history of the Friends of Bradleys Bushland Reserve and to pay tribute to the work achieved by the recently retired bushcare group, Mosman Council hosted a well attended wildflower walk and talk in September 2009 at Bradleys Bushland reserve.

Feral Animal Program

In February 2010, Mosman Council in conjunction with other key land managers across Sydney released Rabbit Haemorrhagic Disease Virus RHDV to control rabbit populations. The virus was released in reserves in Mosman, including Little Ashton Park and Sirius Cove. The release of RHDV in Mosman resulted in a significant reduction in the number of adult rabbits in these areas. The release of the virus at Balmoral Park was halted due to the discovery of a roosting Powerful Owl, which is a threatened species.

Pittwater Council

Careel Creek Estuarine Rehabilitation Project

Council received funding from DECCW for rehabilitation of Careel Creek Estuary. This project included 1000's of trees planted as well as bush regeneration contractors conducting weed control along the length of the creek. The result of this project will be a continual corridor of native vegetation along the length of the creek from Careel Bay mangroves to the Avalon Village and connecting the mangroves with Avalon Beach dunes. Endangered Ecological Communities where restoration has occurred include; Coastal Saltmarsh and Swamp Oak Flood Plain Forest.

Pittwater Spotted Gum Forest Restoration

Pittwater Spotted Gum Forest is a listed endangered ecological community which is home to a large number of local native animals, including many bird species and the endangered Squirrel Glider. Council undertook works to help restore and protect the natural state of the Pittwater Spotted Gum Forest in critical areas, especially in public reserves. In addition Council is continuing to work with local property owners to ensure this forest community is going to be around for generations to come.



Grevillea species. Source: Pittwater Council

Targeting Noxious and Environmental Weeds

A number of projects targeting noxious and environmental weeds have been completed utilising "Caring for Our Country" grant funding. The Warriewood Beach Coastal Biodiversity Project involved primary weed control, planting of native tubestock, creation of new dunes to assist the provision of native animal habitat and beach stabilisation in the face of climate change. The Crown of Newport Conservation of Endangered Communities Project supported private land owners to learn about weeds and native plants on their properties as well as bush regeneration work to restore two endangered ecological communities: Pittwater Spotted Gum Forest and Littoral Rainforest. The Mona Vale Dunes Biodiversity Protection Project involved professional bush regeneration, interpretive signage and field days to plant in the dunes.

In addition work has continued with the Crown Land grant to control the Bitou bush at Palm Beach, Bangalley and Careel Heads and noxious weeds have also been controlled on crown land sites at Ingleside and North Newport. Aquatic and terrestrial noxious or high priority weeds have also been controlled including *Ludwigia peruviana*, *Salvinia molesta* and *Paspalum quadrifarium*.

Fauna Surveys

Through the Coastal Environment Centre, Pittwater is conducting fauna surveys across 6 sites in the Narrabeen Lagoon catchment area to determine a baseline of fauna across a number of habitat types. The aim is to identify any trends in the populations of mammals, reptiles, birds and amphibians as well as including biodiversity education such as anabattling, frogging, spotlighting and seabird rescues.

Feral Rabbit Threat Abatement

Through the "Caring for our Country" grant program more areas have been controlled for rabbits using a combination of methods. Rabbit Calici virus was released for the first time in Pittwater with strong anecdotal success within 1km from release sites.

Warringah Council

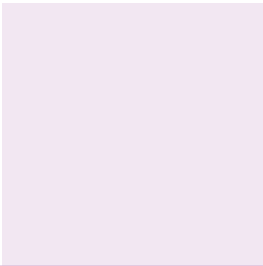
Update of Warringah's Natural Area Survey - Vegetation Communities and Plant Species

Warringah Council updated its Natural Areas Survey (undertaken in 2005) during the 2009/10 year. The Natural Areas Survey is an inventory of the vegetation communities and flora species present within the LGA. A significant tool and feature of the survey is the electronic vegetation mapping that accompanies the report. The mapping spatially displays Warringah's vegetation communities and the locations of threatened species. The mapping is used extensively by Council staff, and is essential for Council's planning and management activities.

The purpose of the project was to update Council's flora species records, update new threatened species locations, map and classify new areas of vegetation that were omitted in the 2005 survey and to re-classify vegetation that was not assigned a vegetation community. Some of the significant outcomes of the update included the addition of 15 flora species, an increase of 134 ha of vegetation assigned a vegetation code (of this, 64.83 ha had not been mapped previously), and a 20% increase in the area of vegetation mapped as the Duffys Forest Endangered Ecological Community. The updated report is in draft form and will be presented to Council for adoption during the 2010/11 financial year.



Asparagus Fern Out Day. Source: Pittwater Council



Support for Bush Regeneration Volunteers

All Warringah Friends of the Bush volunteer sites have been assessed for strategic value and most groups have now been provided with a contract supervisor and a site plan. The program supports 231 volunteers at approximately 51 sites. A propagation nursery at Manly Dam has been established to supply volunteers with local native plants required for regeneration works.

Endangered Bird Found in Dee Why

Many people may remember that in December 2008, Warringah was visited by an endangered Bush Stone-curlew, nicknamed "Curly". Given the vulnerability of Curly's new home, she was relocated by staff from DECCW and Council officers to a safe location in Kincumber on the NSW Central Coast, where a lone male was known to reside. In January 2010, Council Officers were informed by DECCW that Curly and her mate had successfully reared a chick, which is an excellent outcome for regional biodiversity.

BioBanking Feasibility Assessment

Warringah Council conducted a BioBanking feasibility study on crown managed land in the Wheeler Creek Valley in 2009/10 to assess the potential for private landholders to create BioBank sites in Warringah (results of which are detailed in the Wheeler Creek Valley BioBank Feasibility Assessment July 2010). BioBanking is a market-based scheme, introduced by the NSW government, that enables biodiversity 'credits' to be generated by landowners who commit to protect and enhance biodiversity values on their land through a biobanking agreement. Results of the study showed the proposed Biobank site has the potential to generate 454 ecosystem credits representing 4 vegetation types and 673 species credits.

Bushland Plans of Management

Warringah Council has been working in consultation with the NSW Land and Property Management Authority to develop the Oxford Falls Regional Crown Reserve Plan of Management. The plan covers the management of multiple parcels of the crown land within the Oxford Falls region of Warringah.

Warringah Pittwater Bushfire Risk Management Plan

Warringah Council held a public meeting on 6 May 2010 to discuss the draft Warringah Pittwater Bushfire Risk Management Plan which was on exhibition for public comment. The draft plan identifies the level of bushfire risk across the Warringah and Pittwater LGAs and establishes strategies to manage bushfire risks that everyone can implement.

The draft Bushfire Risk Management Plan includes information about the local area and sets out strategies that can be implemented to manage bush fire risks, including:

- ensuring developments in bush fire prone land comply with the NSW Rural Fire Service's *Planning for Bush Fire Protection*
- requiring permits to light a fire during the bush fire danger period
- distributing Bush Fire Safety Pamphlets to all rate payers, and
- weed control and mowing on Council Reserves.

New Wildlife Webpage

One of Warringah Council's objectives is to manage the natural environment by conserving and protecting Warringah's unique native fauna. In order to do this Warringah Council has taken the initiative to complete fact files for residents that provide information about the native wildlife. The webpage promotes the protection and conservation of Warringah's animals of which there are over 400 species of native animals living in oceans, wetlands, lagoons, creeks, sandstone outcrops, hilltops, woodlands coastal scrubs and our own backyards. Of the 400 native species found in Warringah, 22 are classified as threatened in Australia, 34 are threatened in NSW and ten are threatened in Warringah Shire.



Endangered Bush Stone Curlew 'Curly'.
Source: Warringah Council