



Sydney Coastal Councils Group

Resilient coasts. Engaged communities. Local leadership. Regional impact.



Photo: Waverley Council

Sydney's Salty Communities



CAPACITY BUILDING: Sydney's Salty Communities - Turning the Tide on Blue+Green Carbon



Sydney's Salty Communities has been a three year grant program funded by the Australian Government, focusing on research, capacity-building and on-ground rehabilitation for biodiversity and carbon storage in 'salt-influenced ecosystems' across Sydney's coastal and urban waterways. The main grant round is largely completed and a supplementary round of projects is underway. The main and supplementary rounds invested just under \$1.3 million in 17 projects, delivering works valued at approximately \$2.8 million.

In addition, a series of 'special projects' was developed to address issues identified by the program's Working Group and Expert Reference Group, and gaps identified in a [Literature Data & Practice Review](#) into coastal zone biodiversity management and knowledge. Special projects have provided capacity building opportunities for biodiversity managers; an assessment of backyard habitat programs; conducted by Macquarie University's ARIES group, (p 6) an assessment of sea level rise and planning implications for salt marsh and mangroves habitats by University of Wollongong and Macquarie University and information on the value and importance of managing Blue Carbon habitats.

SCCG also partnered with CSIRO to deliver the *Climate Ready Tool* (p 4). Climate Ready Tool Workshops instructed natural resource managers and researchers in the use of the tool and provided opportunities to work together on evidence-based case study projects.

The 'Salty community of practice' of Sydney's urban coastal biodiversity managers, educators and researchers working together on similar issues sharing of resources, planning and problem solving, facilitates the development of evidence-based practice and is an important legacy for the program.

Main round projects

From 23 applications received for the main grants round, eleven projects were funded. Successful grantees were the councils of City of Sydney, Lane Cove, Northern Beaches (two projects), Mosman, Bayside (leading a group of 11 other councils), Waverley, Willoughby, Sutherland and North Sydney. OceanWatch also received a grant to collaborate with Willoughby, Ryde, and Lane Cove Councils.

TABLE 1: MAIN & SUPPLEMENTARY ROUND PROJECTS – ON GROUND TARGETS AND OUTCOMES

| Measure | Target | Actual | Variance | % Variance |
|---|--------|--------|----------|------------|
| <i>No. of Community Participation & Engagement Activities</i> | 297 | 336 | +39 | +13% |
| <i>No. of Management Plans developed</i> | 2 | 2 | - | - |
| <i>Area covered by pest treatment (ha)</i> | 323.2 | 1479.7 | +1,156.5 | +358% |
| <i>No. of individual animals or colonies killed/removed</i> | 32 | 196 | +164 | +513% |
| <i>Total new area treated for weeds (ha)</i> | 127.7 | 135 | +7.3 | +6% |
| <i>Total no. of plants grown & ready for planting</i> | 2,500 | 4,728 | +2,228 | +89% |
| <i>Area of revegetation works (ha)</i> | 7.4 | 11.7 | +4.2 | +57% |
| <i>Kilograms of seed sown (kg)</i> | 2 | 2 | - | - |
| <i>No. of plants planted mature height >2m</i> | 7,105 | 9,414 | +2,309 | +32% |
| <i>No. plants planted</i> | 59,588 | 65,118 | +5,530 | +9% |
| <i>Average survivability of tubestock and seed stock (%)</i> | 85.5% | 88.6% | +3% | +3.6% |
| <i>No. of plants surviving with mature height >2m</i> | 6,128 | 8,389 | +2,261 | +37% |

Urban Aquatic Corridors, City of Sydney Council



The City of Sydney partnered with the University of Sydney's Centre for Research on Ecological Impacts of Coastal Cities and the Royal Botanic Gardens Sydney to create an aquatic corridor consisting of 60 'flower pots' installed within the tidal range of the Farm Cove seawall. The pots have already resulted in an 80% increase in the number of fish and invertebrate species using the seawall as habitat. Over 500 school students have been introduced to the project. A successful Ecological Engineering Forum also showcased interventions to support intertidal biodiversity from around the world.

Gore Creek Reserve Bush Management, Lane Cove Council

Lane Cove Council worked with residents and BushCare groups to revegetate Coastal Escarpment Littoral Rainforest and surrounding vegetation communities. The project delivered over 50% more plants in the ground than planned.

North Palm Beach dune restoration, Northern Beaches Council



Weed treatment and replanting as part of the North Palm Beach dune rehabilitation, Pittwater Council.

This project rehabilitated a highly degraded area of coastal dune within the North Palm Beach dune system. The site was acting as a reservoir for weed seed that was impacting other areas. The project delivered an area of revegetation 50% greater than its target.

Bilgola Creek Restoration, Northern Beaches Council



This project tackled major weed infestations and revegetated patches of two threatened ecological communities: Themeda grassland on seacliffs and coastal headlands (NSW) and Littoral Rainforest and Coastal Vine Thickets of Eastern Australia (EPBC). Over 2,250 native tubestock plants and 2kg of Themeda seed were planted over three sites. A community planting and information day was held on the Bicentennial Walkway track, which was also upgraded to limit damage to the Themeda grassland.

Mosman Foreshore Biodiversity, Mosman Council

This bush regeneration project targeted specific areas of human encroachment along the interface between bushland and private land on the foreshores of Quakers Hat Bay and Beauty Point. Mosman Council worked to raise awareness amongst residents of the challenges posed by 'garden escapees' as sources of weeds in native vegetation.

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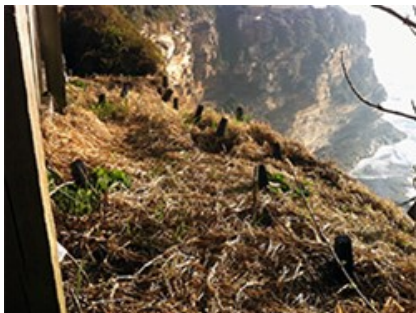


Integrated Fox Control, Bayside Council (lead)



This project brought together 11 councils and the Royal Botanic Gardens Sydney (RBGS) to coordinate a regional approach to fox management. The partners have shared resources and standardised guidelines for fox management and a web portal, foxscan.org.au, encourages residents to report fox sightings. RBGS has established a monitoring program to answer core research questions about urban foxes and has secured the legacy of the project's research with two Australian Postgraduate Awards to undertake these studies. The group now has a home with SSROC as the Pest Animal Action Network (PAAN).

Waverley Coastal Heath, Waverley Council



Waverley Council revegetated and improved the condition of remnant native coastal cliff-top heath vegetation communities, also increasing their floral diversity and reducing invasive weeds. The outcome has been an increase in the size and resilience of these remnant vegetation communities. The project exceeded its target for surviving numbers of plants with mature height over 2m by over 50%.

Willoughby Salty Ecosystems, Willoughby City Council



This project has improved connectivity of native vegetation along the Lane Cove River. Work primarily consisted of invasive weed removal to allow natural regeneration of indigenous species, supplemented with plantings of indigenous plants to strengthen connection particularly of saltmarsh areas along the Lane Cove River. Chatswood Golf Club collaborated with the project by reducing their edge mowing, resulting in biodiversity benefits but also cost savings in reduced time spent on maintenance.

Sydney's Living Shorelines, OceanWatch



This is an innovative experiment using natural fibre open-weave bags of oyster shells (waste from commercial farms) to protect eroding riverbanks and stabilise riparian and coastal vegetation. It is hoped that over time, new oyster spat will settle on the shells and form a self-sustaining 'reef'. [Preliminary testing](#) of the structures has been undertaken at UNSW's Water Research Laboratory at Manly Vale with positive results. Trial bags have been installed at five sites. This project has been extended into 2017 due to delays in obtaining the required permits.

Woronora River Resilience, Sutherland Shire Council



This project reduced the impacts of aggressive environmental weed species on threatened flora and fauna in the Woronora River system. Sutherland Council enhanced native flora and fauna biodiversity at nine sites, increased public knowledge of the area's natural values and ameliorated the impacts of past inappropriate urban development. All environmental targets were exceeded in this project.

Balls Head Reserve Canopy Recovery, North Sydney Council



Poor tree health and canopy loss at Balls Head due to over-abundance of arboreal termites (*Nasutitermes walkeri*) led to this project to research the possible benefits of termite control on canopy health in an isolated remnant. A consulting arborist advised on best practice termite control and the Australian Catholic University (ACU) developed a monitoring regime to assess short and long-term responses in tree health. Promising results have led to the project being expanded to Berry Island. It will take some years to determine the full impact of the intervention on the canopy, so the project will be maintained into the future via an ongoing collaboration between North Sydney Council and ACU.

Supplementary Round Projects

The six supplementary round projects, involving grants of \$358,687 to deliver projects valued at over \$790,000, commenced in 2015-2016 and were completed by the end of 2016. These include *Connected Corridors for Biodiversity*, a project led by the Southern Sydney Region of Councils (SSROC) to collate existing habitat corridor mapping and identify opportunities for connectivity across council boundaries; and *Hollows as Homes*, run by the Royal Botanic Gardens and Domain Trust with the Australian Museum and Sydney University in collaboration with 39 Sydney councils to monitor wildlife use of tree hollows with the help of the community. Northern Beaches had four projects: in the Pittwater area a biocontrol project to introduce the Salvinia beetle to Warriewood Wetlands; a holistic catchment project in Dee Why Lagoon; bush restoration for Fisher Bay near Manly and Fishermans Walk restoration near Curl Curl.



| The Climate Ready Tool

The CSIRO was commissioned by the SCCG under the Salty Communities Program to develop *Climate-ready Biodiversity Management: A tool to help design biodiversity projects in the face of climate change*.

The tool is designed to help councils and other natural resource managers to understand the long-term implications of climate change on the biodiversity of their areas, to overcome barriers to adaptation decisions and to plan near-term biodiversity conservation initiatives that allow for future adaptation to climate change scenarios.

The tool was developed through a series of webinars and workshops with biodiversity managers facilitated by CSIRO and the Australian Resilience Centre with input from the Salty Communities Expert Reference Group. Greater Sydney Local Land Services provided an additional small grant to further explore the tool with Local Land Services staff through an additional series of workshops. The Climate Ready Tool is ready for use and available from the SCCG website.

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Biodiversity Restoration Dee Why Lagoon, Northern Beaches Council



This project took a whole of lagoon approach to restore and reduce impacts of urbanisation, to restore ecosystems and to protect species diversity. The council worked in collaboration with Birdlife Australia and, through a fauna fair and other workshops, engaged with the community to educate them on lagoon health and climate change. The project established a seed bank using a mix of seed provenance from this and other lagoon systems. The project also conducted fauna surveys and pest management to support native populations, and mapped tree hollows to better understand habitat in the area. By working with the community NBC aims to reduce future impacts on the lagoon system. The project vastly exceeded its plant propagation of 500 plants, delivering 2,425 tubestock ready to be planted.

Biocontrol in Warriewood Wetlands, Northern Beaches Council



This project aimed to control the growth and spread of *Salvinia*, a water weed which was choking the Warriewood Wetland EEC. The project trialed biological control in Sydney through the introduction of the cyrtabagous weevil at Warriewood, and combined this with mechanical and physical control. The project dealt with flooding which washed out some of the weevils and some of the *Salvinia*, as well as temperature issues which influenced weevil growth and breeding. A good relationship was forged with Hawkesbury River County Council which also uses the weevils to manage *Salvinia*. The project engaged with local schools to educate the students on the importance of fragile environments in terms of biodiversity as well as community health and enjoyment.

Fisher Bay Restoration, Northern Beaches Council



This project worked to restore coastal remnant vegetation in 6 ha of high use bush (the Manly Scenic Walkway) linked to Sydney Harbour National Park in the east and Garigal National Park in the west. The vegetation was mostly Littoral Rainforest. There has been a substantial reduction in Weeds of National Significance and noxious and environmental weeds. The project engaged area residents and nearby community members in events and ongoing activities which sought to increase knowledge of the area's environmental significance and encourage stewardship of the reserve, including activities which seek to improve backyard habitat function. The project more than doubled its target for plantings, with 1,043 plants planted. These had a 6-month survival rate of 93%, well ahead of their 85% target.

Hollows as homes, Royal Botanic Gardens & Domain Trust



An online database was developed to enter details of hollows across Sydney. Community members were engaged, with workshops run in collaboration with councils, to teach the community to record the attributes of hollows and trees, and to monitor wildlife use of hollows. Participants attending Hollows as Homes workshops reported a statistically significant improvement of their ecological knowledge. As a result of the project 557 tree hollows and nest boxes have been reported by 374 people. The project is developing further activities with schools. There is also an upcoming workshop for councils to develop management plans which promote tree hollow retention.

Fishermans Walk, Northern Beaches Council



The project delivered an improved wildlife corridor linking Endangered EECs of Curl Curl to the coastal corridor of Freshwater/McKillop Park, with the assistance of community and corporate volunteers as well as contractors. In exceeding its targets, the project propagated over 2,300 native plants and in total over 4,200 plants of over 30 different species were established to replace areas initially degraded by Weeds of National Significance and other environmental weeds. A percentage of plants were propagated from flora further north of this area in an effort to improve climate change biodiversity resilience in the corridor.

Connected Corridors for Biodiversity, SSROC



The member councils of SCCG and SSROC provided existing mapping of habitat corridors which was collated and consolidated into a single GIS layer. As a result opportunities for connectivity and contiguity across council boundaries were identified and highlighted. Greater Sydney LLS is hosting this mapping on their server for the next 4 years and will be facilitating the annual updating of the layer by councils. To support this GIS layer a review of existing tools, programs and incentives to promote conservation on privately owned land was provided. In response to the strong positive response to the map, opportunities to extend it to cover the whole of the Greater Sydney area are being pursued.



| Backyard Habitat Review

The Australian Research Institute for Environment and Sustainability (ARIES) was commissioned by the SCCG under the Salty Communities Program to conduct a review of backyard habitat programs. The guiding research question was *What are the most effective tools available to council to encourage biodiversity on private land?*

The review's aim is to examine what a comprehensive backyard native flora and fauna habitat program may include, and to provide a summary, via a series of case studies, of the various programs available for councils and others to implement.

Participants in the review were all councils in the Sydney Coastal Council Group's Sydney's Salty Communities program and known neighbouring programs interested in completing a questionnaire about their backyard habitat programs: 18 completed the questionnaire and 12 councils participated in the interviews. Three external programs also contributed material: *Birds in Backyards*, *Backyard Buddies* and *Habitat Stepping Stones*.



UNIVERSITY OF WOLLONGONG AUSTRALIA

Mangrove & Saltmarsh Threat Analysis

SCCG engaged the University of Wollongong, in partnership with Macquarie University, to undertake a Mangrove and Saltmarsh threat analysis. Given its extraordinary relative importance as habitat, as Blue Carbon storage, and for fisheries, the aim of the project was to provide knowledge of the potential impacts of sea-level rise on mangrove and saltmarsh and policy and management actions that can be implemented to improve ecosystem outcomes for mangrove and saltmarsh in the Sydney Region. Key elements of this project include:

- review of the pressures and impacts on mangrove and saltmarsh in the Sydney Region;
- preparation of a first pass assessment of the vulnerability of mangrove and saltmarsh to inundation and erosion related to sea-level rise and other climate related processes;
- higher resolution assessment of their vulnerability to sea-level rise using spatial modelling approaches integrated with available datasets; and
- overview of adaptation barriers and opportunities, including strategic planning activities that can be implemented to improve the ecosystem services provided.

Salty program fact sheet series

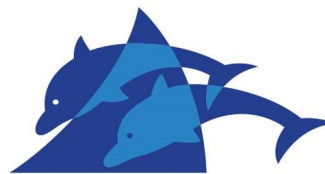
This project has produced six fact sheets (shown below) covering some of the many outcomes and learnings from the program. All are available for download and topics covered are: Adaptation & the Climate-Ready Tool; Planning for Climate Change; Blue Carbon; Connecting People & Nature; Engaging Communities; and Fox management.



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Australian Government



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