

ILLAWARRA COUNCILS AND SOUTHERN RIVERS CMA PARTNERING IN BIODIVERSITY CONSERVATION IN THE ILLAWARRA

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Abstract

The Illawarra Councils; Kiama Municipal Council, Shellharbour City Council and Wollongong City Council, have partnered, with support from the NSW Environmental Trust's Urban Sustainability Program to develop and implement an Illawarra Biodiversity Strategy (the Strategy). Partnerships with Southern Rivers Catchment Management Authority (CMA) and Department of Environment, Climate Change and Water (DECCW) have enhanced the coordinated approach to developing the Strategy, ensuring it assists in meeting higher order state and regional biodiversity targets. The Catchment Action Plan (CAP) (Southern Rivers CMA, 2006), and Threatened Species Prioritisation (DECCW, 2008) provided guidance for the development of the plan through the setting of regional targets. These targets have been translated into more specific priorities and actions for the partner Councils. By working together the coordination and future management of biodiversity across the Illawarra region has improved.

The Strategy describes a method used for prioritising natural areas for investment in bush restoration. To guide conservation priorities across the landscape, it also maps regional biodiversity corridors and prioritises vegetation types using endemism within the region as a key variable.

Southern Rivers CMA implements the Strategy through funding restoration work in priority natural areas, and the delivery of the 'Escarpment to Sea' project which aims to work directly with landholders within regional corridors to improve land management in high priority areas. The Councils implement the strategy through a range of co-ordinated regional and independent actions in natural area management, land use planning, data collection and community participation.

This paper discusses the collaborative process of developing the Strategy, the challenges arising from data gaps and the lack of resources to fill these; and maintaining connectivity as a key strategy for biodiversity conservation in the face of climate change.

The Southern Rivers CMA and Illawarra Councils in partnership

There has been a long history of effective collaboration and partnerships between Southern Rivers CMA and the three Illawarra Councils. By working together, much has been achieved to protect and improve the natural values of the Illawarra, with investments being made from the escarpment to the sea.

There have been a number of site specific projects between the individual councils and Southern Rivers CMA. These have included the protection of the coastline along the Kiama Coast Walk with Kiama Municipal Council, Elliot Lake stormwater improvement works with Shellharbour City Council and the conservation of coastal endangered ecological communities with Wollongong City Council.

Additionally there has been a strong and productive working relationship between Southern Rivers CMA and Southern Councils Group. This partnership has seen the delivery of the Small Farms Network in the Illawarra, Battling the Bitou Bush Menace project and working cooperatively to coordinate activities and work at a regional scale.

A logical next step for the partnership was to better define the local natural resource management (NRM) priorities. Working on the Illawarra Biodiversity Strategy provided the means to do this.

Southern Rivers CMA regional planning

The Southern Rivers Catchment Action Plan establishes ten year targets for the improvement of the natural resources within the Southern Rivers region, covering the northern Illawarra to the Victorian border and including the tablelands and Snowy Mountains. Targets have been set for biodiversity, water, soil, coast and community outcomes.

Planning at this regional scale demonstrates how Catchment Management Authorities and regional communities can contribute to national and state NRM targets and priorities. Regional scale planning however does not provide a detailed framework for how local action and local communities can collaborate to improve their natural environments.

Effective NRM requires planning at a range of scales. Southern Rivers CMA has commenced a process of developing NRM Action Plans in each of its six sub-regions to support improved local collaboration, action and delivery. The Illawarra NRM Action Plan (the Plan) is the first of these plans to be completed.

The Plan establishes the key NRM targets and priorities for the Illawarra sub-region, set in the context of broader regional, state and national targets. Targets are the focus for collaborative action by the full range of community, industry and government partners in the Illawarra, each of whom contributed to the development of the Plan through the Illawarra NRM Reference Group.

The Illawarra Councils in partnership

The three Illawarra Councils form the Illawarra sub-region within the Southern Rivers CMA. Together, the Illawarra Councils are responsible for an area of approximately 109,000 hectares. The Illawarra Councils all share a similar geography; a narrow urban and rural coastal plain framed by the scenic Illawarra escarpment. This shared geography presents each of the Illawarra Councils with many shared biodiversity values, and threats.

The resident population of the three Local Government Areas (LGAs) are significantly different, with Kiama's population estimated at 20,258, Shellharbour's estimated at 65,587 and Wollongong's estimated at 198,324, based on 2008 Census of Population and Housing data (Australian Bureau of Statistics, 2009). Given the population projections for the Illawarra of an additional 47,600 by 2031 (Department of Planning (DoP), 2006), careful planning is needed to safeguard the regions most valuable biodiversity assets.

In recent years, the councils have partnered together in other environmental initiatives, including, the Illawarra Sustainable Roadmap, and Sustainable Illawarra. The

successful receipt of a NSW Environmental Trust Urban Sustainability Program grant, allowed the Illawarra Councils to collaborate further to identify biodiversity priorities and how councils can contribute to meeting Regional and State biodiversity targets.

How can local planning be informed by state and regional planning?

NRM requires planning at a range of scales; national, state, regional, sub-regional and local. When done effectively, there are clear linkages between each of the plans, so that local action contributes to sub-regional targets and so on. It is clear that for national, state and regional investments to be effective, good local and sub-regional planning is essential. Ultimately, it is planning at this scale that identifies local priorities, hot spots and issues that require on-ground action. It is also at this scale that people and communities come together and can easily focus collaborative action.

Southern Rivers Catchment Action Plan defines how national and state targets are delivered at a regional scale. The DECCW Threatened Species Prioritisation and the Illawarra NRM Action Plan prioritise and define how these targets are delivered at a sub-regional scale and the Illawarra Biodiversity strategy then identifies individual sites and actions that contribute to higher order targets.

Each of the plans are nested together, and inform each other. A key outcome from planning in the Illawarra is that it is clear that targets are informed from higher order plans, but also that lower order plans inform higher order plans. The detailed site specific collection of information and prioritisation in the Illawarra Biodiversity Strategy has informed the Illawarra NRM Action Plan, allowing sub-regional and regional targets to be more refined and focussed.

The Draft Illawarra Biodiversity Strategy

It has long been recognised in the Illawarra that investment in NRM is best managed at a regional level (NCC, 1999). A regional strategic approach is more likely to improve coordination and management of biodiversity across the Illawarra. A regional approach also makes best use of knowledge and resources (Illawarra Councils, 2010).

The Strategy aims to guide a program for biodiversity management for the three Illawarra Councils over the next five years. The aim of the Strategy is to outline how the Illawarra Councils will contribute to meeting state and regional targets. It defines a program of actions that address onground activities, land use planning, community participation and knowledge management. We acknowledge that there are also many other stakeholders with an influence on biodiversity outcomes in the Illawarra region. Accordingly, the Action Plan intends to enhance and support the work being undertaken by these other stakeholders; whilst providing a clear set of priority actions to be undertaken by the Illawarra Councils.

The Strategy aims to address the following objectives:

1. A coordinated and regional approach to biodiversity conservation, so as to maximise knowledge sharing and efficient use of resources between the Illawarra Councils;
2. Identify biodiversity priorities to guide the Illawarra Council's and other land managers in future decisions and planning;
3. Encourage and promote the conservation of biodiversity across the Illawarra;

4. Identify and manage threats to biodiversity across the Illawarra;
5. Improve understanding of biodiversity values of the Illawarra;
6. Identify anticipated threats to biodiversity from climate change;
7. Improve community awareness, and encourage and support community participation in biodiversity conservation; and
8. Contribute to the achievement of targets defined by the Australian Biodiversity Conservation Strategy 2010-2020, NSW State Plan, Southern Rivers CMA's CAP, Illawarra Regional Strategy, and the NSW Threatened Species Priorities Action Statements.

The Strategy was developed as a partnership of the Illawarra Councils. It was overseen by a multi-agency reference group, and engaged key regional stakeholders to identify threats, biodiversity values, priority vegetation types and threatened species, regional corridors, and recommended actions.

Some of the key components of the Strategy are outlined below.

Climate change

Climate change is the least understood, but potentially the most pervasive of threats to biodiversity (Auld and Keith, 2009). This makes biodiversity planning in the context of climate change very challenging.

Management of climate change impacts to biodiversity involves the integration of three key conservation approaches (Auld and Keith, 2009); These have been used to guide the development of the Strategy:

- Eliminating or at least minimising further loss of remnant habitats;
- Management of existing threats in remnant habitats will enhance the capacity of species to persist *in situ* and form the base from which migration events may occur; and
- Improving the capacity of, and opportunity for species to move across the landscape.

These three approaches have been used to guide the development of the Strategy.

Regional corridors

The biodiversity value of corridor networks is well known, and reinforced by the climate strategy of “improving the capacity of, and opportunity for species to move across the landscape” (Auld and Keith, 2009). There is also a clear mandate for planning for corridors as shown by the various state, regional and local policies and plans promoting them, including Australia's Biodiversity Conservation Strategy-draft (Commonwealth of Australia, 2009), Southern Rivers CAP (Southern Rivers CMA, 2006), draft Illawarra NRM Plan (Southern Rivers CMA, 2010), and the Illawarra Regional Strategy (DoP, 2006).

The retention and enhancement of corridors is important because landscapes that retain more connections between patches of otherwise isolated areas of vegetation are more likely to maintain more numerous and more diverse populations of various plant

and animal species. Conversely, a lack of landscape connectivity can have a range of negative impacts on species populations (Lindenmayer and Fischer, 2006).

Biodiversity corridors in the Illawarra had been defined in part, or in broad terms from previous work (DoP 2006, National Parks and Wildlife Service 2003, Southern Rivers CMA 2010). However, boundaries of this corridor were not well defined for Shellharbour and Kiama LGA. Taking guidance from the high order targets and regional plans, we engaged with local experts, and reviewed previous studies to delineate and map boundaries in order to define a regional corridor network. This was done to facilitate improved incorporation of the corridors into planning instruments, and to guide biodiversity planning and conservation priorities.

Most of the areas defined in the Strategy as forming part of a regional corridor network had already been flagged in broad terms as core conservation areas in previous studies. This is because they are large, biologically diverse, contain a diversity of habitats and vegetation communities, contain habitats for threatened species, and contain vegetation communities that are significant to New South Wales and the Illawarra region (Mills and Associates 2000).

Prioritising vegetation types

Southern Rivers CMA's CAP, 2006 and NRM Action Plan, 2010 define priority vegetation types as those with "30% of their original distribution being managed for conservation". The barrier to determining this is that there is no reliable mapping of the pre-European extent of vegetation communities in the Illawarra. To define a more specific list of vegetation priorities for the Illawarra we devised a classification of vegetation priorities using South Coast-Illawarra Vegetation Integration (SCIVI) vegetation mapping (Tozer *et al*, 2006).

To do this, an assessment was made of the endemism and reservation status of each vegetation community in the Illawarra compared with the entire SCIVI study area. The SCIVI study area extends from Sydney in the north to the Victorian border in the south and west to Goulburn (Tozer *et al*, 2006). This enabled a comparison to be made between the distributions of plant communities within the Illawarra against the whole SCIVI study area. Using this information, a ranking of three priority classes was developed (1 being highest). This was designed to help inform the meeting of CAP targets and priority conservation vegetation across the Illawarra.

Table 1: Vegetation Priority Classes

Priority	Endemism (% of distribution within the Illawarra)	Proportion of community reserved in NPWS reserves in the Illawarra
1	>60%	<15% reserved
2	<60%	<30% reserved or listed as EEC
3	<60%	>30% reserved

Table 1 shows how the vegetation priorities were classified. Those communities with a higher endemism (>60% distribution) to the Illawarra that have not met their conservation targets ranked as the highest priority. These communities have very limited distribution beyond the Illawarra region. As such, their management and

conservation hinges on regional efforts. Most of the Priority 1 vegetation occurs on the Illawarra coastal plain and foothill rainforests south of Wollongong. Priority 1 vegetation communities include *Illawarra Lowland Grassy Woodland*, *Illawarra Subtropical Rainforest*, *Bracelet Honey Myrtle Scrub* and *Coastal Upland Swamps*.

Priority 2 vegetation is still poorly reserved, but captures most vegetation types that are not restricted to the Illawarra. Most vegetation types in the Illawarra fell into this category.

Priority 3 vegetation types were limited to those communities that are well reserved. These were confined mostly to the Budderoo Plateau within National Park estates. This included mostly sandstone woodlands, gully forests and heaths.

Implementation of the Illawarra Biodiversity Strategy

Prioritising natural areas

An assessment of the biodiversity values of public lands under Council care and control (Community and Crown Land) was undertaken to strategically identify priority sites for the allocation of limited resources.

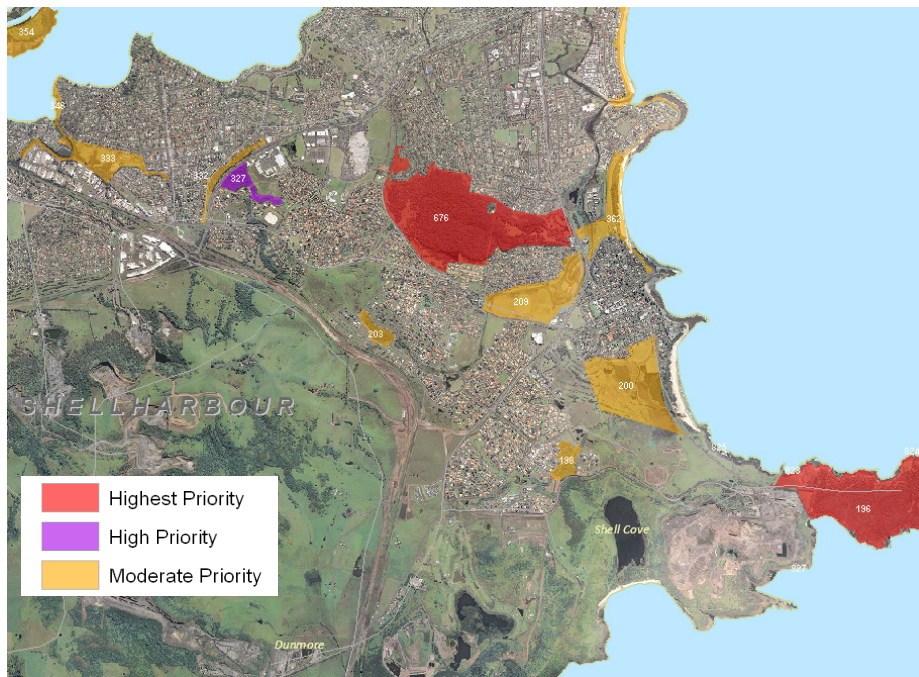
Through engagement with the biodiversity reference group a hierarchy of variables was identified to prioritise the sites with the highest biodiversity value. Each of these variables was classified to enable a systematic ranking of sites and their relative values. The ranking was based on a combination of variables including vegetation type, connectivity (presence within a regional corridor), patch size, and type of existing management. Each variable was classified with different score weightings to generate a combined priority score.

Priority vegetation types were deemed to have the highest importance in determining priority sites. Once the priority vegetation types were identified, these were combined with the other variables. The existing management regime was also included, so that current restoration efforts would be acknowledged.

Patch size classes were defined into three categories, 0-2 hectares, 2-10 hectares, and >10 hectares. This categorisation is based on studies that demonstrate that 2 hectares is the threshold for plants under which biodiversity declines rapidly (Drinnan, 2006). Patch size was determined by assessing the extent of continuous vegetation beyond property boundaries.

As a result of the assessment process described above, a ranking of Community and Crown land sites were derived for each LGA, classifying sites as highest, high, moderate and low priority. The maps will be used by the Illawarra Councils to guide the allocation of grant and internal funding to priority sites. An example of the mapped output is shown in Map 1.

Map 1 Natural Area Priority Map example, Shellharbour LGA



Vegetation Condition Monitoring

Monitoring and evaluation is now a standard component of satisfying grant funding requirements, and good project management generally. In recent years in the Illawarra, the response has been to implement different vegetation monitoring methods at different bush restoration sites as it was required by different grants. This reduces the use and interpretation power of the data collected. To improve this situation a vegetation condition monitoring protocol was developed, based on the DECCW standard vegetation survey template. The survey proforma was put into plain language for bush regeneration contractors, and local government natural area staff, and undertook some pilot testing was undertaken in the field to refine it's useability. Following the development of the survey template, skills training was delivered to bush regeneration contractors and natural area council staff of the Illawarra.

The monitoring aims to assess the impact of land management at key restoration sites, and to assess long term vegetation change at these sites. The survey design is a "before/after" design where the survey is carried out in the same location before and after restoration activities. The aim is to sample the same plots over a time frame exceeding individual contracts, in order to assess longer term change in vegetation condition.

The survey is based on fixed a 20 x 20m plot design. The plot is marked in the field for repeated survey at the same location. Given the rate of expected change in vegetation, a sampling frequency of no less than yearly is anticipated. Within the plot, the per cent foliage cover, abundance and height of the three dominant species within the canopy, mid and ground story is recorded. Species richness and percentage exotic versus percentage native cover of the canopy, mid and ground stratum is also assessed. Data will be analysed by the council coordinating the collection of data.

Figure 1. Vegetation monitoring training day at Bass Point,



Shellharbour

A standardised approach to monitoring across priority natural area sites in the Illawarra will expand our knowledge about the general condition of natural areas and vegetation change, in response to bush restoration.

West Dapto LEP Stage 5 Wollongong LGA

West Dapto LEP Stage 5 represents a land use planning opportunity to ensure that, at the very least, the larger, more resilient remnants of Illawarra Lowland Grassy Woodlands within Wollongong LGA are zoned in a manner that would allow for retention and enhancement of these remnants. The study area encompasses an area also described as the Yallah–Marshall Mount Corridor.

The Draft Illawarra Biodiversity Strategy identifies Illawarra Lowlands Grassy Woodland as one of the top three priority vegetation types in the Illawarra, along with *Melaleuca armillaris* shrubland and Illawarra Subtropical Rainforest. Illawarra Lowlands Grassy Woodland is endemic to the Illawarra. The community's prevalence on the coastal plain has resulted in its distribution being heavily depleted by grazing, and urban development. Most existing remnants are small and fragmented.

No areas of Illawarra Lowlands Grassy Woodland are included in formal conservation reserves, though some small patches are included in council reserves (NSW Scientific Committee, 1999). Therefore, the management challenge for this community is that it occurs almost entirely on private land. Managing this community to ensure its future viability depends largely on the attitude and aspirations of private landholders.

Wollongong City Council is working together with DoP, DECCW, Southern Rivers CMA, and landholders to progress this stage of the LEP. Presently, we are in the first stage of this planning process which involves identification of the constraints. Relevant to this paper are the biodiversity constraints that have been identified during the early stages of the planning process. To this end, field surveys were undertaken to ground truth vegetation mapping and also to assess vegetation condition. Observations were made upon floristics, canopy, mid story and ground story condition, and the presence of hollow bearing trees. Assessing fauna values will involve review of former studies, identification of survey gaps and possible further targeted surveys.

The identification biodiversity constraints will be combined with other considerations such as flood constraints to identify linkages that will allow for the best opportunities for protecting woodland remnants.

Escarpment to Sea

The Southern Rivers CMA Escarpment to Sea project aims to improve biodiversity conservation in the Illawarra by protecting and enhancing remnant habitats in priority corridors that link the escarpment to the sea. Priority local and regional scale corridors and native vegetation communities have been targeted for on-ground actions that seek to improve native vegetation condition and connectivity within these corridors.

The project engages and supports landholders to improve their management of native vegetation in the identified corridors, with a particular focus on Illawarra Lowlands Grassy Woodlands and Illawarra Subtropical Rainforest. The project is being implemented in partnership with local councils, Landcare and DECCW.

The project is guided by the Illawarra NRM Action Plan and is complementary to a range of biodiversity conservation projects being implemented by other partners in the Illawarra, including local government projects targeting improved management of public lands.

Investments through the Escarpment to Sea project contribute to the achievement of targets at all scales, be it the Illawarra Biodiversity Strategy at the local scale or the Caring for our Country targets at a national scale.

Conclusion

The development and implementation of the Illawarra Biodiversity Strategy has highlighted the importance of a number of important principles that are fundamental to good natural resource management planning.

Firstly, that natural resource management requires planning at a range of scales; national, state, regional, sub-regional and local. When done effectively, there are clear linkages between each of the plans, so that it is clear how local site specific actions contribute to sub-regional targets and so on. Importantly, local scale planning can then be used to refine the targets and priorities in higher order plans, contributing to more effective regional, state and national NRM planning.

Secondly, productive partnerships and relationships are fundamental to NRM planning. To effectively plan for and address NRM issues, collaborative action by the full range of partners within community, industry and government is required. The Illawarra Biodiversity Strategy demonstrates the strength of the partnership within the NRM community, where people have come together with the intent of setting clear and objective priorities for the Illawarra.

Thirdly, a plan is only as good as the commitment to implement. Even prior to the finalisation of the Strategy, partner organisations and Councils are already implementing the actions in the Strategy.

Finally, the Illawarra Biodiversity Strategy and the Illawarra NRM Action Plan have provided clear and specific directions for natural resource management in the Illawarra:

- Ensuring complementary and coordinated action by all parties
- Providing a framework to ensure that landuse planning decisions contribute to natural resource management priorities
- Encouraging collaborative action

- Providing a framework for attracting additional investment
- Communicating a clear message to the community of the Illawarra on the important natural resource values and priorities of the area.

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