

# **The Lake Macquarie Landcare Model: Council and Communities partnering in Coastal Management**

## **Introduction**

The Lake Macquarie Local Government Area encompasses the largest coastal saltwater lake in Australia (110km<sup>2</sup>), stretches across 30km of coastline and includes beaches, rocky reef, seagrass, saltmarsh and mangrove habitats. Historical works, urban development and recreational activities impact on the health of the coastal environment. The challenge of managing these significant and diverse natural areas has seen Council employ a raft of management strategies.

One of the most successful and cost effective strategies Council has adopted has been to fund and support Landcare activities on public land as a formal component of its operations, and to engage, support, and empower the local Landcare community to take on a management role of natural areas, including coastal and estuarine environments. This has been achieved through Council's ongoing funding and support to Landcare groups provided through the Landcare Resource Centre, which is embedded in the Natural Assets section of Council's Asset Management Department.

Through the Landcare Resource Centre, local Landcare groups receive training and induction to safe work methods and environmental best practice, are provided with equipment and resources (such as tools, mulch and plants), and work with Council Officers to develop a specific action plan for their site. The Landcare Resource Centre supports almost 300 Landcare groups working across the Council area in all parts of the coastal system, including in upper catchments and creek lines, along foreshore and saltmarsh areas, and through beach and dune systems. This work follows a set of consistent guidelines and practices. The activities of Landcare groups are also able to add value to a variety of other projects such as the Lifeguard Winter Works program and the Estuaries Management grant funded sites.

## **Background to Lake Macquarie**

Lake Macquarie (and its surrounding city of the same name), is located on the Australian east coast, approximately 100 km north of Sydney. The City of Lake Macquarie is the fastest growing city in the Hunter and one of the largest cities on New South Wales (About Lake Macquarie (2012) Retrieved October 15, 2014, from <http://www.lakemac.com.au/about-lake-macquarie/about-lake-macquarie>). The lake is an example of an ICOLL (Intermittently Closed and Open Lake or Lagoon) which is now a permanently open coastal lake, due to entrance training works and dredging (Haines, 2008).

The traditional Aboriginal name for Lake Macquarie is Awaba (meaning flat place) and the people who inhabited the area and the greater Hunter Valley are collectively the Awabakal people (History of Lake Macquarie (2014) Retrieved October 15, 2014 from <http://www.lakemac.com.au/about-lake-macquarie/history>). The history of Awabakal settlement of Lake Macquarie extends back beyond 8000 years as evidenced through several midden and other archaeological sites (History of Lake Macquarie (2014) Retrieved October 15, 2014 from <http://www.lakemac.com.au/about-lake-macquarie/history>). As a skilled hunter-fisher-gatherer society, the coast and lake

provided critical resources to the Awabakal people, as well as being central to their spiritual and cultural narrative.

The history of European activity at Lake Macquarie dates back to August 1800 when Captain William Reid of the Schooner *Martha*, accidentally sailed into the mouth of Lake Macquarie on a coal-seeking voyage, mistaking it for the Hunter River (Clouton, 1967). An Aboriginal tribe directed Reid to a site where he was able to obtain a load of coal and return to Sydney (Clouton, 1967). It was not until his return that the error was discovered and subsequently the Lake was named "Reid's Mistake" until renamed Lake Macquarie in 1826 (Clouton, 1967). When Captain Reid navigated the lake entrance, there was barely 4-foot draught in the channel. The lake's various resources of coal and timber were highly valuable to the colonies economy; however, the transient nature and shallow draught of the channel continued to impede development. Accessing the lake required that a permanently navigable channel be established, and in 1880's the construction of a rock breakwater on the northern bank of the channel commenced (Clouton, 1967). European settlement of Lake Macquarie commenced around the late 1820's and progressed rapidly after that time, supported by the well established settlement at Newcastle (Clouton, 1967). The construction of the breakwater, its subsequent enhancement, periodic dredging and impacts of European settlement on the foreshore and catchment has changed the dynamics of the estuary and the nearby beach.

In addition to the channel management activities and their effect on the coastal environment, the beaches of Lake Macquarie have been subject to sand mining, resulting in complete loss of dune structure across nearly the entire length of sandy coastline. Urban development, while encroaching less onto beaches than in other areas of NSW, has caused loss of habitat and impacts in terms of land use, altered hydrology, vegetation structure and dumping of waste. Likewise inappropriate activities such as 4-Wheel Drive access, illegal clearing for view amenity, damage to salt-marsh and historical/current coal mining activities (with associated practices such as disposing of chitter as landfill) all put pressure on the integrity of the Coastal Zones.

The Lake and its catchment area is now home to a city of over 200,000 residents (About Lake Macquarie (2012) Retrieved October 15, 2014, from <http://www.lakemac.com.au/about-lake-macquarie/about-lake-macquarie>). Foreshore and coastal urban development, agriculture, industrial activities, commercial and recreational fishing and other recreational activities continue to influence the function of the coast and lake. Lake Macquarie City Council (LMCC) has developed a range of responses, policies and practices in the management of its diverse natural areas, with lake and coastal management featuring strongly in this.

## **Lake Macquarie Landcare**

Landcare is a grass roots movement that revolves around people volunteering their time and effort to improve our natural environment. Landcare became a National movement in 1989 with the establishment of Landcare Australia, however community groups have been tackling local environmental issues for far longer than this. Landcare in Lake Macquarie is a partnership between the volunteers, Council and the Lake Macquarie Landcare Network (LMLN). The LMLN is the umbrella organisation through which Lake Macquarie Landcare sites are registered with Landcare Australia and acts as the collective voice for almost 300 Landcare groups across the Local Government Area.

In November 2000, LMCC opened the facility initially called the Lake Macquarie Landcare Resource Office (LRO) at Fassifern. The LRO was a Council facility

operated through the Assets Management department that delivered support to community groups working on Council owned and managed land through a Council employed Landcare Coordinator and several contract staff. The level of commitment from Council has increased steadily over the past 14 years, and now the renamed Landcare Resource Centre provides high-level support to Landcare volunteers who have access to two full time and six part time Council staff. With a budget in excess of \$300,000 the centre provides training, tools, equipment, direct assistance, plants, mulch, expertise and planning support to groups working across all of the lakes natural environments.

Consulting with the volunteers and the LMLN, Council has developed its own Landcare support systems to minimise the legislative burden on volunteers and to empower them to undertake works at their own pace and level. Volunteers are guided through the process of developing a plan of action for their site by Council's Landcare Coordinator. They are provided with Council permission and insurance cover to undertake works on Public Land. The payoff for this support, is that volunteers working on Council owned and managed lands control weeds and improve native habitat values, delivering real outcomes to Council. Landcare groups are empowered to work without direct supervision by Council staff through a process that provides the training and site knowledge they need to make informed decisions. The key steps in the process are:

- Initial site visit
- Team Leader Training
- Site Vegetation Assessment
- Agreed Action Plan development

### ***Initial site visit***

The initial site visit is the first real point of contact between the Landcare Coordinator and a potential volunteer interested in carrying out Landcare style works on Public Land. At this point, the potential volunteer has usually already identified that they would like to undertake weeding works on a particular parcel of Council owned or controlled land and are seeking assistance from Council. In many cases, they have already been carrying out some weeding works and have been referred to the LRC by another department of Council such as the Rangers. The site visit gives the Landcare Coordinator the opportunity to determine if the site is suited to Landcare activities, and to determine if the Landcare model can adequately meet the expectations of the person(s) involved. Likewise, the potential volunteer has the opportunity to develop an understanding of what is involved and what support Council can provide if they choose to form a Landcare group. If the Landcare model is determined to be the 'right fit', the potential volunteer is booked into Team Leader Training.

### ***Team Leader Training***

Team Leader Training is essentially a works induction to Council's Landcare system. Held on a monthly basis, a small number of people, representing different sites can be inducted in a single session. Like any workplace induction, it involves providing vital safety information to the worker, explaining acceptable methods of carrying out activities in the workplace (the Landcare site). Volunteer workers are taken through the process of risk assessment and Workplace Health and Safety legislation as it applies to

them. The key risks (manual handling, working with tools, the environment etc.) are discussed and the volunteers are encouraged to consider how this information might apply to their particular site. Basic Bush Regeneration principles are explained (for example the Bradley method of working from good to bad, the importance of some weeds as habitat, regeneration versus revegetation) and again, participants are encouraged to discuss their own sites in the context of this information. While a very small number of participants might, at the end of the process, decide that they do not want the responsibilities of taking on a Landcare site, the majority of participants report feeling much better prepared to undertake the works involved. Participants are provided with a variety of resources including weed and native plant identification books and Bush Regeneration manuals, a First Aid kit, sunscreen, insect repellent and a daily work diary. They fill out a registration form for the site they are interested in working on and this triggers the next stage of the process – a Site Vegetation Assessment.

### ***Site Vegetation Assessment***

The Site Vegetation Assessment is carried out by the Landcare Vegetation Officer and develops a baseline for the site that can be used to plan future actions and monitor progress of the group. A plant species list and the remnant or expected vegetation communities across the site are identified (including Endangered Ecological Communities or EEC's). The assessment also identifies missing structural components and major threats to the site. The assessment is provided to the Landcare volunteers, helping to develop their appreciation of the values of their site. The information is also used by the Landcare Coordinator and Landcare volunteers to develop an Agreed Action Plan.

### ***Agreed Action Plan development***

The Agreed Action Plan is a set of agreed, appropriate actions that the Landcare volunteer is willing to undertake that will work towards improving the site habitat values. The capacity of the volunteers involved to undertake required works is matched with the best possible outcomes for the site. This allows the development of a set of site priorities, work zones and appropriate methodologies that will guide the volunteers' activities. Site-specific risks are identified along with other constraints such as requirements to maintain access or Asset Protection Zones. Volunteers find the Agreed Action Plan a highly valuable tool to help them focus their energies and work in a methodical manner. The actions outlined are very rarely time-lined, as this has the potential to set the group up to fail if they are unable to meet arbitrary project milestones. Once the Agreed Action Plan is completed, it is passed onto Council's Community Planning Department for formal approval of the activity. This ensures that Landcare activities on a particular parcel of Public Land are in line with any over-arching Plans of Management for that site.

### **The Landcare Communities involvement in Coastal Management**

The health and function of coastal zones extends beyond the interface between the sea and the land. Planning practices, catchment management, vegetation management, sewerage discharge, channel maintenance and infrastructure development are all components that need to be carefully considered (Haines, 2008).

Plans of Management need to be developed beyond the identified coastal zone to adequately address coastal impacts (Lake Macquarie Estuary and Coastal Management Committee, 1999). Based on this logic, almost all of the 300 groups engaged in Landcare across Lake Macquarie could be said to be in some way engaged in Coastal Management as they tend to work to improve catchments, creek lines, foreshore, or dune vegetation systems. There are nine Landcare groups operating across almost all of the beaches in Lake Macquarie, another four Landcare groups operating on the coastal headlands and another three Landcare groups operating on the Swansea Channel (the entrance channel to the lake). Groups working directly on the lake's foreshore could also be included in this count, as well as those working on creeks that flow immediately into the lake.

Focusing on the immediate coastal zones, the dunal system within the Lake Macquarie bio-region has been subjected to extensive disturbance through sand-mining, dune reconstruction works and planting, and post sand-mining activities. Some of the plantings involved establishment of Bitou and *Acacia saligna*, which now forms a major component of Landcare weeding works.

Volunteer driven restoration work commenced at Redhead in 1977, Frenchman's Beach in 1988, Caves Beach in 1989, Blacksmith's Beach in 1993, and Catherine Hill Bay in 1996. Active Landcare/Dunecare groups are still working zones within all of these sites and Lake Macquarie City Council provides funds through the Landcare Resource Office and other programs for professional dune maintenance to assist these groups.

Council Plans of Management have been created for Catherine Hill Bay [September, 2001], Caves Beach [September, 2001], Swansea Heads [September, 2001], Dudley Bluff [September, 2001], and Blacksmiths Beach [September, 2001]. Landcare activities are designed to be compatible with, and even complementary to the above POMs. There is currently an updated Lake Macquarie Coastal Zone Management Plan in draft, which will go out to Community Consultation in November this year.

For the most part, the dunal system in Lake Macquarie is reconstructed, but in the hind-dunes, headlands, and unmined smaller beaches, mosaics of original native plant communities remain, and species lists from these remnants often form a template for enrichment planting of the Landcare sites following weed removal. Many of these remnant mosaics are Endangered Ecological Communities (EECs), and some contain Threatened Species. For example, Littoral Rainforest remnants and *Syzygium paniculatum* (Magenta Lillipilly) remain at Illawong Park and Salts Bay on Swansea Heads. Freshwater Wetlands on Coastal Floodplain, Swamp Oak Floodplain Forest, Swamp Sclerophyll Forest on Coastal Floodplain, and Riverflat Eucalypt Forest on Coastal Floodplain remain behind the barrier dune system at Redhead Beach and the Belmont Coastal Wetland Park. Themeda grassland on Coastal Seacliff and *Pultanaea maritima* Coastal Headland Pea remain at Dudley Bluff, Redhead Bluff, and Swansea Heads/Caves Beach. Landcare groups are active on all but one of the above mentioned sites.

Generally, foredune areas are fairly well-vegetated with *Spinifex*, *Scaevola*, *Carpobrotus* and *Acacia*, while the hind-dunes are generally a mix of native plant species; *Banksia integrifolia*, *Banksia serrata*, *Leptospermum laevigatum*, *Monotoca elliptica*, *Melaleuca nodosa*, *Allocasuarina distyla*. In some cases, at Redhead and Frenchman's Beach for example, the *Acacia sophorae*-*Banksia integrifolia*-*Leptospermum laevigatum* dune thicket has been reconstructed over large areas and Bitou weed control has formed a substantial component of dune maintenance work. In these reconstructed native plant communities, low species diversity is a common issue, though the opportunity now exists, through the Landcare/Dunecare groups, for enrichment planting of mosaics of unrepresented local dunal communities (destroyed

through the sand-mining process) to be established as part of Landcare's follow-up of dune maintenance and weed control works.

The Landcare structure in Lake Macquarie has also proven a successful mechanism for the re-engagement of the local Aboriginal community in Natural Area management. Lake Macquarie Landcare has developed a strong relationship with the Bahtabah Local Aboriginal Lands Council (LALC). Bahtabah representatives are consulted when Aboriginal heritage issues are identified on sites in their Lands Council area. Aboriginal Green Teams have been engaged by Council through the LRC to carry out works along the Coastal Zone, especially where heritage values require cultural sensitivity to be applied. Bahtabah has an ongoing contract with the Council to undertake marine debris clean-up activities on the lake, channel and coastline. This provides opportunity for members of the Aboriginal Community to be gainfully employed, as custodians of the land.

The weed management and revegetation works delivered by the Landcare groups represent years of investment by local community members. The outcomes that have been achieved by these groups are far beyond that which could have been achieved by Council funded works alone. This is particularly true when the longest running programs are considered. In the 1970's and 1980's very few Local Governments had the financial capacity or motivation to devote resources to natural area management. Community involvement in the management of natural areas provides opportunities for long running programs and access to grant funding. One of the most successful examples of a community driven coastal management project in Lake Macquarie is Blacksmiths Beach Dunecare group.

### **Blacksmiths Beach Dunecare**

Blacksmiths Beach is located above the northern Lake entrance breakwater. The Dunecare site runs from the north of the Blacksmiths Beach Surf Lifesaving club to the 4-wheel drive beach access point off Awabakal Avenue, covering a distance of about 1 kilometre. The site extends about 300 metres inland from the high tide mark and covers an area of 10.5 hectares. The Dunecare group formed in June 1990 following a public meeting sponsored jointly by LMCC and the then Department of Land and Water Conservation (DLWC). At this stage, Blacksmiths Dunecare was one of only 5 Dunecare groups in NSW. Local community members engaged in a partnership with the DLWC and Council to rehabilitate the dunes.

The major issues identified were:

- Weed infestations – specifically Bitou bush
- Damage to dunes caused by 4-wheel drive vehicle access
- Lack of formal access ways for the public to access the beach
- Absence of a natural dunal system due to historic mineral mining operations
- Lack of native vegetation in dune systems due to presence of exotic plant species
- Vandalism

Across the Blacksmiths site, Bitou bush formed a dense monoculture, reaching heights of up to 3 metres. Between the access tracks, the vegetation was virtually impenetrable. The group worked with participants of Commonwealth Government job-skill development schemes in the early 1990's to carry out manual removal of the weed species. This saw 80% of the infestation removed over a two-year period. The remaining weeds are now at a point of 99% eradication, and the group can now control most remaining weed species.

Beach Spinifex was acting to stabilise the beach fore dunes, however uncontrolled 4-Wheel Drive vehicle access was inhibiting the grass growth and wheel ruts were leading to sand mobilisation. The group consulted with the Newcastle 4WD Club to develop a formal vehicle access off Awabakal Avenue, and fencing and signage prevented vehicle movements to the south of this access way while vehicles were still permitted to use the beach areas north. Exclusion allowed the development of the Beach Spinifex and some level of dune stabilisation. This was achieved between 1990 and 1993.

The lack of a formal dune structure post-sandmining meant that sand deposited onto the beach by natural coastal processes continued to migrate, and waves would breach the dunes, flowing onto Ungala Road during storm surges. In 1993, Council funded dune reshaping with heavy machinery to create fore dune and hind dune structures. Once the earthworks were completed, Landcare volunteers carried out planting of (the then recommended) Marram Grass and direct seeding with 20 kgs of *Acacia sophorae* seed. Up until recently, the group also carried out twice-yearly fertilisation of the Beach Spinifex to achieve rapid growth and sand stabilisation. While increasing nutrient levels in natural ecosystems is not usually recommended, in this instance it achieved the desired outcome of rapid structure development. There have been ongoing plantings over the past 20 years to develop an increasingly complex dune vegetation structure, and native vegetation is now recruiting naturally to the site. A recent vegetation survey identified the presence of heath plant communities developing through natural recruitment amongst dense *Acacia sophorae-Banksia integrifolia-Leptospermum laevigatum* dune thickets.

In 1991, the group were involved in formalising and fencing walking access tracks to the beach to prevent damage to native vegetation and the dunes. In 2014, Council replaced the access fencing as part of its asset renewal program. The major works, the track formalisation and the groups' ongoing weed management works have acted to decrease incidents of littering and vandalism as community appreciation of the site has grown. In October 2009, a fire went through the dunes, and the native regeneration that has occurred since then is a strong indicator of the success the Dunecare group has had in creating a healthy environment with many of its pre-disturbance natural characteristics.

## **Support across other departments**

LMCC has an ongoing commitment to the support of Landcare across the Lake Macquarie Local Government Area. Funding for Landcare is automatically allocated in each year's budgets, including allowances for inflation. This funding is derived from the Assets Management Department budgets for Natural Areas and forms a part of the delivery of the 'Caring for the Environment' Focus Area from LMCC's five-year Operational Plan. Beyond direct support of the Landcare groups in Lake Macquarie, other programs across Council also provide valuable support to Landcare projects. Specific to the Coastal Management theme are the Combined Councils works and the Life Saver Winter Works programs. Combined Council works involve weed management teams from surrounding Council areas carrying out cooperative programs of weed control in each other's LGAs. In Lake Macquarie, this work is frequently focused on dune Bitou infestations. The Life Guard Winter Works Program redeploys some of Council's permanent Life Guard staff to carry out spraying of weeds in dune areas during the off season.

Both these programs can provide valuable support to the coastal Landcare works. Where they are occurring on Landcare/Dunecare sites, they help the groups to achieve

weed control beyond the normal capacity of the group. Where they are adjacent to Landcare/Dunecare sites, they help decrease pressure from weed species encroachment. Council also gains a benefit where the sites have a Landcare presence. Outside of the spraying cycle, there is a volunteer presence to monitor and manage re-emerging weeds, to monitor regeneration and potentially to carry out planting works where appropriate.

Likewise, Ecosystem Enhancement projects delivered by Council's Sustainability Department frequently target Landcare sites. This not only supports the outcomes of the Landcare groups, it also provides potential for ongoing maintenance of project works by the community. An example of this is the dune reconstruction works that have been carried out north of Blacksmith Beach Dunecare site. In this area, Council has funded further 4-Wheel Drive exclusion fencing, Bitou bush removal and revegetation works that should have very similar outcomes to those achieved by the Blacksmiths Dunecare group.

## **Conclusion**

The success of the Lake Macquarie Landcare model clearly demonstrates that the community can be directly involved in Coastal Management across a Local Government Area. Local Governments have the flexibility to develop systems of support for the volunteer community across a geographical region that other levels of Government might lack. This is particularly true, as operations of Local Government programs do not tend to be vulnerable to shifts in political alignment. A Council also has greater capacity to coordinate projects with the capacity to 'value add' to one another due to their relatively small size and shared Corporate Objectives.

The engaged community is a very powerful entity. Residents of an area have a real stake in improving the health of their natural environments. Their commitment to local causes and issues is usually a long lasting one. From this perspective, community volunteers have the capacity to persist with a course of action over a long period and achieve high-level results. Much like waves that transport sand in constant cycles through coastal systems, it is not the size or strength of any one volunteer effort that makes the difference; it is the consistent nature of the same effort, delivered repeatedly that brings about real change.

## **References**

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