

## MANAGING BUSHLAND REMNANTS IN THE URBAN ENVIRONMENT

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**Summary** The greening movement in New South Wales encompasses a range of practical field-based activities including: bush regeneration; revegetation, tree planting and urban forestry; the creation of wetlands, linkages and wildlife corridors; and the restoration of habitats in degraded and/or highly urbanised landscapes. State and federal governments have made funds available to the community and local councils to implement such 'green' projects, yet individual projects are rarely co-ordinated between LGAs or regions, which results in some duplication of resources and highlights the need for a total catchment management philosophy.

Bush regeneration is one facet of this movement. Started in Sydney by the Bradley sisters over two decades ago, bush regeneration has grown to become one of the most popular environmental activities in the Australian community. There have been extensive and far reaching changes in the industry over the past decade. These are viewed from the point of view of a major practitioner, an instigator of many changes, and from her experience as one-time manager of the two largest bush regeneration companies in New South Wales.

### THE GREENING MOVEMENT—AN OVERVIEW

Over the past two decades the greening movement, allied with its near relatives, 'environmental awareness' and (at times), 'political correctness', has grown from humble beginnings in the community arena to become a strong political force, and undeniably, a major enterprise for some government agencies and private industry alike.

The greening movement in Australia has many facets – all are concerned in some degree with the rehabilitation of degraded landscapes and the re-establishment of functioning 'natural' ecosystems. These broadly-based environmental activities include: bush regeneration; tree planting and urban forestry; Dunecare and Rivercare projects; wetland construction; the creation of wildlife corridors and linkages; conservation of roadside vegetation in rural areas; and habitat re-creation in a variety of degraded, highly urbanised and/or greatly altered environments.

The quest for environmental responsibility within the community has broad social, political and economic implications. While many of the activities listed above are community-based, many are undertaken by a growing body of professional workers, and in some areas, by

relevant government agencies. In addition, for some years, government has supported unemployment relief schemes where resources have been diverted into environmental field work (e.g. LEAP), although funds for these programs have been severely reduced in the current financial climate.

Whether such work is carried out by voluntary or paid workers, almost all environmental projects in Australia are supported wholly or in part by public money – as outright grants from the State or Commonwealth, through local council rates, or by special environmental levies raised for designated activities (e.g. land acquisition, rehabilitation of bushland areas).

In New South Wales (NSW), the Local Government Act 1993 requires that management plans be prepared for community lands, including areas of remnant bushland in the care and control of local government authorities (LGAs). The preparation of these plans requires expertise in strategic planning, combined with a sound knowledge of ecological principles and experience in the management of natural systems. This expertise is generally in short supply, a situation which has spawned a plethora of environmental consultants in the private sector (including the author), and this has highlighted the need for staff retraining and in some cases, radical changes to the structure of public sector agencies.

Further, from 1993, each LGA in NSW has been required to prepare a comprehensive State of the Environment Report (SoE) which, among other items, identifies remnant bushland areas and wildlife corridors/linkages, the location of rare or threatened flora and fauna species, and areas of high natural and cultural conservation. The SoE Reports also identify polluted lands and industries/activities within the LGA which contribute to environmental degradation. Current environmental remediation and monitoring projects are listed, and the need for further investigation is detailed. The SoE Reports are lodged with the Department of Urban Affairs and Planning (DUAP) and subsequently made available to the general public.

Surveys, biophysical inventories, the preparation of management plans, conservation plans, recovery plans and rehabilitation strategies for remnant bushland areas are now accepted by the community and government as an integral part of the planning process. Funds are allocated annually by the LGAs and other agencies to

prepare such documents, and as funds become available, to implement their recommendations. Regrettably, resources are often allocated on the basis of local community (political) demand rather than on a planned basis to fulfil the aims of broader regional or catchment management objectives.

#### ISSUES AND PROBLEMS

Issues in natural area's management are complex: goals and objectives are diverse and not infrequently, contradictory. The very fact that there are so many stakeholders involved is often a recipe for chaos. Consider the input into a single project of government officers at local, state and federal levels, including planners, politicians, landscape architects, managers, plus various external experts and advisors, ecologists, soil conservationists, agriculturalists and engineers, conservation bodies, special interest groups, activists, and not to be left out, the professional bush regenerators.

Such an avalanche of expertise may lead to confusion and failure to identify the primary aims of the project, failure to establish clear objectives and identify desired outcomes. There may be failure to link the project into existing or proposed local or regional planning instruments or to other similar projects. Opinions may differ on the best way to utilise resources, selection of labour, sequence work, and always a contentious issue, the determination of specialised rehabilitation methodologies and techniques.

When public funding is sought by a community group or an LGA, confusion may arise about which grant program to utilise, how to best determine which funding agency will give the best deal, and for the planners and land managers, how the various government grant programs interact and complement each other.

With such a wide range of environmental rehabilitation programs underway in the public and private sectors, and with so many grants now available, it is often difficult to see a clear link between the various players. One may be forgiven for asking questions. For example, is there any common planning strategy underlying the differing grant programs available to the community, local and state governments? How do the various unemployment relief schemes fit into the regional planning picture? Is there duplication of effort, resources and project management? Is there a waste of public money and in the longer term, is anything worthwhile (sustainable) being achieved?

Some agencies (e.g. Environment Protection Authority, Landcare) have risen to the occasion by appointing special advisory officers to deal specifically with the problems raised above and to assist the community in formulating grant applications. The officer is able to guide

the group or the council through the maze of grant applications and wherever possible (and this depends on good regional networking), to make the applicants aware of complementary projects and of other groups with similar objectives.

Community consultation is today seen as fundamental to the planning and management of natural areas, and few would disagree with this concept, but in practice, this varied and often highly political procedure does not always give the best results. Given the complex of planning and consultation processes listed above, the additional requirement to consult with and listen to community demands, adds another dimension to the task of getting things done on the ground. It is a brave man (or woman) who can weave their way through this bureaucratic maze and still come out at the other end with the original project goals and objectives still intact.

#### BUSH REGENERATION TO ECOLOGICAL RESTORATION—AN EVOLVING SCIENCE

The second half of this paper looks at one facet of the greening movement—bush regeneration—from its simple beginnings in the 1960s when small was beautiful and peace, brotherly love and flower-power were all the vogue, to present-day ecological restoration, a worldwide movement based on the scientific knowledge, applied ecology, and the re-establishment of ecological processes: an approach which frequently utilises highly experimental technologies and address a whole range of environmental issues from the rehabilitation of small highly specialised habitats to broad-scale recreation of whole ecosystems.

**The beginnings—the Bradley method** The 'bush regeneration' movement founded in the late 1960s by the Bradley sisters was one of the first environmental activities to capture the public imagination. The Bradley Method of Bush Regeneration provided a small-scale but practical approach to bushland restoration and empowered conservationists and community volunteers working to combat weeds and general degradation in remnant urban bushland.

Thanks to the widespread promotion of the Method by the National Trust (NSW), the bush regeneration movement has spread, and endured, throughout Australia. The acceptance of the bush regeneration philosophy by the community-at-large, has also been instrumental in promoting other, broadly-green ethics within the community. Although bush regeneration has undergone many and often radical changes in methodologies and approach over the past 25 years, the basic philosophy first promulgated by Joan Bradley has been central to the development of modern-day bushland

regeneration, or as it is known internationally, 'ecological restoration'.

In its simplest form, bush regeneration 'is the rehabilitation of bush from a weed-infested plant community to a healthy community composed of native plants' (Buchanan 1989) and aims 'to restore and maintain an ecosystem in which natural regeneration can occur' (National Trust of Australia (NSW) 1986).

In 1971, Joan Bradley put forward the idea that controlled weeding without replanting was the best method of rehabilitating degraded urban bushland. Bringing Back the Bush, her book published posthumously in 1988, explains the Method in these words:

*'Weeding a little at a time from the bush towards the weeds takes the pressure off the natives under favourable conditions. Native seeds and spores are ready in the ground, and the natural environment favours the plants that have evolved in it. The balance is tipped back towards regeneration. Keep it that way by always working where the strongest area of bush meets the weakest weeds.'*

The use of hand weeding to remove weeds from bushland is the basis of the traditional Bradley Method, a method which advocates minimal soil disturbance, and weeding only moderately disturbed areas where the rate of native plant regeneration will keep pace with the rate of weed removal.

The Bradley Method promotes a relatively simple, weed-oriented approach to bush regeneration. Perhaps because of its very simplicity, its low-key, labour-intensive approach has been widely adopted by many community volunteers and school groups over the years. To implement the Method requires dedication, perseverance, patience and well-developed skills in plant identification and manual weeding techniques.

**On the way to ecological restoration—bushland management** Possibly the biggest change in our approach to bushland rehabilitation has been the introduction of a comprehensive planning phase. Before starting on-the-ground weeding there are basic questions to ask. e.g. why are the weeds growing in bushland, how did there get there, what are the major impacts leading to degradation and can we stop or reduce these impacts? If the answers come up as urban drainage, dumping, fill soils or the lack of fire, then some form of action can be taken to make the job easier and—most important—the outcome has some change of being sustainable. Asking such questions and seeking to address impacts before the weeding starts, demonstrates a major shift, from a weed-centered to a causal approach.

Thorough site inventories are crucial: not only are detailed flora (and where possible, fauna) lists made, but significant species and/or habitats are identified, external and internal impacts identified and a site history (including a fire history) is compiled. Ideally soil and water tests should be included in the inventory and arrangements made with the client to continue a monitoring program after the initial work is completed.

The whole project site is carefully mapped to scale. Wherever possible, a GIS or similar mapping program is used to facilitate on-going monitoring. Fixed photopoints are put in place, and in the quest for hard quantitative data, a series of permanent quadrats established. Wherever practical, students (especially tertiary-level research students) should be encouraged to take part in the project. Their work may provide important information which would not otherwise be available to the client, or the regenerators. The shift from a purely subjective form of reporting towards an objective and quantitative format which allows for on-going evaluation and re-assessment of methodologies represents another change in approach.

Site assessment on a local and regional scale is also extremely important. Far from seeing the project site as an island of bush in a suburban ocean, each remnant should be viewed as a link or stepping stone in a (possibly) discontinuous vegetation corridor. The project remnant may be isolated at this point in time, but with careful planning, selective street tree planting and/or further rehabilitation work in nearby remnants, an acceptable corridor may be possible, especially for bird species. It is often up to the regenerators to point this potential out to the client. The formation of Catchment Management Committees in the Sydney area has been instrumental in educating the community to think, and act on a broader scale. The shift from a purely local to a regional or total catchment perspective is yet another major change in approach.

Community consultation is of course, an integral part of the whole process. If the client is a LGA, a steering committee of council officers and community representatives is frequently set up to oversee the project. Regular reporting sessions, which include the presentation of quantitative monitoring data and written reports, allows the community to have a strong input into the project. Local expertise is invaluable in the planning phase, and for the more active members of the community, it provides a chance to get involved at a hands-on level.

There are of course, numerous other changes in approach to implementing a bushland rehabilitation program. Many of these are changes in methods and techniques (e.g. specialised tools, selective herbicides), but the few examples listed above highlight the importance of the planning phase and evaluation procedures – items which were often curtailed or omitted in earlier projects.

They also emphasise the open-ended or holistic nature of the modern-day bush regeneration movement, which now incorporates knowledge and methodologies from a broad spectrum of academic disciplines and practical work in the field – which is in sharp contrast to the early bush regeneration projects which focused almost entirely on plant identification and regenerating any broadly-Australian plant species (although, to be fair, bird watching has always been a keen interest for many bush regenerators).

#### A PRACTITIONER'S PERCEPTION

At the beginning of 1986 I first became involved in bush regeneration through the National Trust in Sydney. At that time, the Trust was the only organisation carrying out both training and hands-on bush regeneration work in NSW, and again, at that time, the Trust promoted and used the Bradley Method exclusively.

Coming from a background in education and most recently from academic research in weed ecology, I was appointed as program leader (Bushland Management Officer) in charge of the Trust's fifty or so bush regenerators. The Trust's bush regeneration teams were contracted out to local councils to weed and regenerate local bushland reserves on a fee-paying basis. Bush regeneration was, and still is, a highly successful commercial venture for the Trust, which maintains a keen interest in the natural as well as the built environment in NSW.

Enlisted by the Environment Director as 'someone with an ecological background who could review the Trust's program dispassionately' (!), I was instructed to review the program objectives, to ascertain if the current (environmental) objectives where being met, recommend and implement changes where necessary, and above all, to keep a low profile. All of the above presented a real challenge – most especially the last.

On the plus side we had a staff of enthusiastic, dedicated, and highly skilled workers, an experienced and very able research officer, the support of Trust executive, a dozen or so on-going commercial contracts, and of course, the good reputation of the Trust.

On the down side, we lacked strategic planning skills and we depended on very simple and time-consuming weed control technologies. Results were rarely assessed against project objectives. We lacked a rigorous monitoring system, and within the workforce there existed only a narrow range of skills – mainly oriented towards plant species identification. Work sessions were short (3–4 hours/day), and as most regenerators were women with school-age children, working hours were adjusted to take account of these responsibilities. The part-time and often erratic nature of the work precluded the participation of many younger people and of breadwinners who needed to earn a regular income.

Ten years ago, bush regeneration was widely regarded as the particular hobby of the well heeled, middle-class woman. Regenerators were not seen as real workers and were often scathingly referred to as 'the ladies with the knives and forks' (referring to their small hand tools).

No more! Bush regenerators now come in all shapes and sizes, age groups and genders. They come from varying backgrounds and possess a broad range of academic and practical skills. In general, educational levels have increased, with many regenerators holding certificates or diplomas from TAFE or university degrees in one of the relevant sciences.

Bush regenerators in Sydney at least, can now make a living. Regular work is available through local councils, private industry, government agencies with land to manage or through one of several dozen bush regeneration and/or native landscape companies. A recent estimate has put the number of bush regenerators working for wages in the Sydney area in excess of 700 individuals. Obviously some of these are part-time workers but possibly as many as 50% are full-time. In addition, many hundreds of volunteers work for various groups throughout the State. In Sydney alone, 500 community bushfire/launcher groups are registered with local councils or agencies such as the National Park and Wildlife Service.

In mid-1990, with a small number of valued colleagues, I left the National Trust to form my own company, Urban Bushland Management. Our aim was to form a company which would act as a training ground for young professionals; where full time work would be available; and where people interested in a career path in ecological restoration could 'cut their teeth' on a broad spectrum of field-based activities. Our hope was that when they moved on, into management positions in government or industry, they would be able to apply their knowledge and experience to initiate and sustain successful rehabilitation and conservation programs.

In this I believe that we have been particularly successful. Over the past six years, UBM has employed and trained almost three hundred bush regenerators. We have been involved in possibly a hundred different projects, ranging from rehabilitation of landslip sites in the Blue Mountains to long-term riverine restoration projects in the Lane Cove River Valley and Darling Mills Creek. Our staff level steadies at about 70, depending on the number of field-based activities underway – usually there are 15 or so projects underway at any one time.

In 1996, UBM decided to take a new path, and leave the bush regeneration field. Opting out of most field activities, we have retained only a few favourite projects to concentrate in the future on consultancy and education. After 11 years as a contractor, it is perhaps time to hand

the reins over to someone else. However, looking around at the environment management scene in Sydney and elsewhere in NSW, it is gratifying to see so many ex-Trust and ex-UBM employees – people who are now in responsible and influential positions, and who will, I have no doubt, make a strong contribution to ecological restoration in Australia. On the personal level, I feel exceptionally proud of our graduates and privileged to have played some part in the development of the bush regeneration movement.

#### SUMMARY

In the mid-1990s, there are possibly more people belonging to Landcare, Bushcare, Dunecare and similar hands-on environmental groups in NSW than any other non-sporting activity – or so it seems if you are in any way involved in the environmental field. The Australian community has shown that it is more than willing to pitch in and help in the restoration process, and while some groups are short-lived or project-centred, there are always new converts to the cause. In fact, there are sometimes more willing recruits than on-the-ground projects to utilise their energy.

The overall approach to the selection, planning and implementation of bush regeneration and other environmental rehabilitation projects has become more rigorous and responsive to community demands. These changes reflect legislative changes to planning instruments and government policies (e.g. Local Government Act, State Environmental Planning Policies). They also reflect the high level of competition for grants from the public purse and the increasing demand to demonstrate achieved 'value for money'.

**Milestones along the way** If pressed to select a number of bush regeneration milestones over the past decade, I would nominate the following issues/innovations/improvements as central to the development of the industry as it stands today.

- Expansion of Knowledge: establishment of advisory committees with experts from a range of disciplines including horticulture, botany, zoology, ecology, earth sciences, chemistry, hydrology, engineering and landscape architecture.
- Education and Training: introduction of Bushland Weed Control certificate course, NSW TAFE colleges, establishment of minimal training level for professional bush regenerators.
- Job Opportunities: re-organisation of works programs to allow full-time employment: enforcement of EIO principles and expansion of workforce to expand numbers of workers of both sexes.
- Technology: introduction of glyphosate herbicide as

a standard bush regeneration tool: use of other selective herbicides for control of particular weed species in specialised habitats.

- Technology: introduction of labour-saving tools (e.g. cordless drill, spot-gun, chainsaw/power tools) and new techniques (e.g. cut stump/poison, stem-scrape/poison, tree injection).
- Technology: experimental trials with herbicides (optimal rates, seasonality, application methods).
- Experimental: use of fire as a management tool: promotion of regeneration burns in selected plant communities.
- Experimental: culling of *Pittosporum undulatum* in inappropriate locations: research into alleopathy.
- Experimental: identification and treatment of keystone weeds only (target weeding): use of herbaceous weeds as nurse crop (selective weeding).
- Planning and Strategy: introduction of locally-indigenous planting concepts (genetic integrity): establishment of first Indigenous Seed Bank in Sydney.
- Planning: preparation of a weeding calendar (for Sydney Region) to optimise weed control processes.
- Assessment and Planning: improved (quantitative) site assessment strategies, including use of GIS mapping systems, Skycam photography.
- Legal and Planning: introduction of Noxious Weeds Act 1993: declaration of environmental weeds allowed on request of individual LGA: establishment of regional noxious weed control committees (LGAs and agencies).
- Education: series of workshops, lectures and conferences to train regenerators and managers (e.g. grasses and sedges, wetland ecology, soil science, genetics, seed collection and propagation, site assessment and planning for community groups, training in techniques and methodology).
- Education: production (with McLoughlin-Rawling Publications), of educational material (booklets, posters, pamphlets): distribution of monthly educational newsletters for staff, clients and the community: preparation of display material, including a video.
- Record Keeping: introduction of quantitative monitoring in addition to qualitative (descriptive, photographic) records: use of computer database technology.

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