

Growing GNANGARA PARK

by Caris Bailey

Getting pines to grow on land cleared of native vegetation around Gnanagara was not all that easy in 1926—in fact, the first seedlings turned bright yellow and wouldn't grow.

Trial and error showed that a missing fungus was responsible, one that helps roots to take up nutrients from the soil. The Gnanagara nursery was growing healthy pines by 1929, but they still grew slowly in the plantation, until the right fertiliser regime was discovered.

The reverse problem now presents itself—how is native vegetation going to grow on land cleared of pines in the new Gnanagara Park?



In the summer of 1994–95, two massive fires swept through Gnangara pine plantation, near Wanneroo, burning out 1,900 hectares of pines and banksia woodlands. The second of these fires, in February, took more than 100 firefighters about 15 hours to bring under control and another two days to mop up. Hundreds of hectares of blackened pines were later harvested to salvage as much timber as possible, and the treetops and other litter were burnt off.

And then, green shoots began to appear. Despite the fires and the fact that some of the burnt sites had been under pine for up to 43 years, native plants began to re-sprout from previously-dormant roots. Following the winter rains, many other species germinated from hard seeds in the soil.

About 50 species regenerated naturally, although at a lower density

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Recreation is one of the four key values identified for Gnangara Park—walkers are already able to explore the area on the Coastal Plain Walk Trail. Photo – Therese Jones/CALM



than the original bushland. The 1994–95 fires had inadvertently provided the Department of Conservation and Land Management (CALM) with its biggest revegetation trial at Gnangara. This area, along with other, smaller, areas where native vegetation has re-established itself, has been examined by CALM scientists as plans to transform the plantation into Gnangara Park are being developed.

The new park will be a massive green belt for the rapidly growing residential and rural areas of Perth's north-west corridor, and the future growth areas identified in the north-east corridor. The decision not to replant harvested areas of pine has been made possible by CALM's program of

planting pine crops on already cleared farmland, where the trees will lower water tables to prevent salinity and waterlogging problems. At the end of last winter, a total of 4,200 hectares of pines had been planted. Assisted by farmers, CALM's target is to plant 150,000 hectares of maritime pine within a decade, and to attract private investment

Above left: Moitch is one of three timber shelters along the Coastal Plain Walk Trail, where walkers can stop for a meal or camp overnight. Photo – Therese Jones/CALM

Below: One of the older sites in the plantation. These pines were planted along Gnangara Road in 1941. Photo – Chris Garnett/CALM





for the project to reach an overall planting target of 500,000 hectares.

CONCEPT PLAN

A Concept Plan for Gngangara Park has been released for public comment. A Technical Working Group with officers from CALM, the Water and Rivers Commission, Water Corporation, Ministry for Planning, Department of Minerals and Energy and Department of Environmental Protection determined a study area of 91,000 hectares, roughly the size of the entire Perth metropolitan area.

This is almost twice the size of the 50,000-hectare park originally proposed (see 'Park for the People', *LANDSCOPE*, Autumn 1997) and is made up of about 20,000 hectares of pine plantations, 47,000 hectares of other CALM-managed estate and 23,000 hectares of other lands, including vacant Crown land and land leased by the Department of Defence. This brings together in one proposal a number of areas that have long been recommended for conservation, recreation and groundwater protection.

The study area covers much of the underground water reserves known as the Gngangara water mound. The Gngangara mound supplies nearly 40 per cent of Perth's drinking water, and this figure is likely to increase to about 50 per cent within the next 15 years. The groundwater also supports many of the area's environmental values, such as wetlands and vegetation.

The study area includes a large area of relatively undisturbed native woodland that stretches across the northern Swan Coastal Plain from the coast almost to the Darling Scarp. The Park will include most of the landforms present on the northern Swan Coastal Plain and contain more than 30 distinct vegetation types. These range from coastal herb fields, through heathlands, scrublands on dunes, limestone ridges



and wetlands, sedgelands in wetlands, low woodlands of banksia, paperbarks or mallee eucalypts to tall woodlands of tuart and jarrah and/or marri.

The area also has a large number of wetlands, most of which contain open water only occasionally or for short periods each year. The wetlands within native vegetation areas are largely undisturbed and of high conservation value. There are also some wetlands with conservation value within the pine plantation.

More than 750 species of native flora have been recorded in the area—a number that is likely to rise as further surveys are undertaken. Two declared rare species, *Eucalyptus argutifolia* and *Caladenia huegelii*, and 18 species listed on the CALM Priority Flora lists occur in the Park. *Eucalyptus argutifolia* grows

Top left: Sand is one of several resources extracted from the Park. Current and future operations will be managed to minimise impacts on other Park uses.

Top: Some native species quickly re-established in former pine plantations burnt out by fires in the summer of 1994–95.

Above: Marri and jarrah have grown around the pines on this site.
Photos – Chris Garnett/CALM

only in the Park and immediate vicinity.

Large numbers of emus and western grey kangaroos are still found in the study area, as well as populations of western brush wallaby, quenda (southern brown bandicoot), western brushtail possum, honey possum, mootit (native bush rat) and echidna.

Two Aboriginal Dreaming trails

Four primary values have been identified as a framework for the concept plan: nature conservation (which is the focus of this article), resources, recreation and interpretation and heritage, each of which has a number of key objectives (see box). The number of different objectives that have to be balanced, highlights the complexity of planning Gngangara Park and the importance of integrated planning.

Nature conservation	Resources	Recreation and interpretation	Heritage
Protect and enhance existing biodiversity, threatened species, wetlands and vegetation communities.	Protect and enhance quantity and quality of groundwater and public drinking water supply.	Develop a wide spectrum of recreational opportunities and public access.	Protect natural and cultural (Aboriginal and non-Aboriginal) values.
Restore flora and fauna habitats and remove feral predators.	Harvest pines within the next 20 years.	Interpret primary values to enhance visitor awareness, experience and enjoyment.	Provide opportunities for appropriate interpretation of natural and cultural values.
	Extract sand, limestone and other resources.	Provide opportunities for nature-based tourism.	

Key objectives for the four primary values identified as a framework for the Gngangara Concept Plan.



cross the study area and features of early European settlement include two stock routes and the old Gngangara town site and tree nursery.

The Concept Plan for Gngangara Park has had to take into account multiple planning requirements, including the soon-to-be-released draft Gngangara Land Use and Water Management Strategy. The plan has also had to consider the interests of a large number of stakeholders, including those using the area for a wide variety of recreational activities and those involved in timber production, mining for basic raw materials (mainly sand and limestone), wildflower picking and beekeeping.

REVEGETATION

Natural revegetation after the 1994–95 fires and after thinning on other sites in the pine plantation, provides a wealth of information for a managed revegetation program. It is already clear that some native species regenerate more readily than others and that different soil types and landforms are more easily revegetated.

The next step will be to map all remnant vegetation in the pine plantations to help identify key areas and examine how the revegetation program can be integrated with forestry operations. In some areas, for example, pine falling techniques could be modified to increase the survival rate of remnant undergrowth species and the harvesting schedule could be planned to clear the most favourable sites for regeneration ahead of more difficult sites. Fire management will also be an issue—a balanced fire management program will be required to provide the necessary protection for the remaining pines (which are killed by intense wildfire), and for the revegetation.

The Concept Plan proposes different priorities for revegetation, which will be carried out over 20 years—the scheduled time for the all the pines to mature and be harvested. Research and monitoring trials undertaken in the

Above left: Coastal heath in the north-west section of the Park.

Left: Yeal Lake is one of many wetlands in the Park, but unlike most, it usually contains water throughout the year. Photos – Chris Garnett/CALM



early years will allow for the program to be improved year by year.

The highest priority will be given to revegetating good quality native vegetation buffers around existing high nature conservation values, such as populations of threatened species, threatened ecological communities and conservation category wetlands. High quality native vegetation corridors will also be revegetated between significant remnants of vegetation. The aim is to recreate vegetation at each of these sites that is as close as practical in structure and diversity to intact native vegetation.

Specific revegetation programs will be carried out in some areas to maximise recharge to groundwater for nature conservation or water supply purposes. Other revegetation programs are proposed on cleared sites in the plantations to enhance amenity values and recreation, tourism and interpretation opportunities.

Experimental plantings to date include scarlet flowering gums, tuarts and river red gums. A trial plot of everlasting seeds from Paynes Find, on the Goldfields, has also been sown.

Less intensive revegetation is proposed in the remaining areas as the pines are progressively removed. Natural regeneration in these areas will initially be supplemented by planting five to 10 native tree and shrub species, at an appropriate density. The aim is to create self-sustaining native vegetation communities that support a diversity of fauna and provide linkages and buffers to high value nature conservation areas in a cost-effective manner.

Seed will be collected from the



existing native woodlands for use in the rehabilitation of degraded areas, either within Gngangara Park or elsewhere. The seed store will be used for both direct seeding and for raising seedlings, as appropriate.

The management and control of weeds will be the biggest challenge for the revegetation program, given that the ability to use certain herbicides in the groundwater protection area will be limited. Strategies to control weeds are still being developed.

WESTERN SHIELD

A key goal under the Concept Plan is to increase available habitats for a range of fauna species and encourage fauna to be reintroduced into the Park. CALM's Western Shield program to control feral predators and conserve native animals will be extended to Gngangara Park.

Above left: Bushwalkers enjoy the panoramic views from Yanchep Rose Lookout, on the circuit trail linked to the Coastal Plain Walk Trail.
Photo – Therese Jones/CALM

Above: This *Banksia menziesii* is one of the overstorey species that CALM plans to re-establish following the removal of pines.
Photo – Chris Garnett/CALM

Baiting will begin in the large existing areas of native woodland found at the northern end and eastern side of the Park. These include Yeal Nature Reserve, the adjacent vacant Crown land and the proposed Wilbinga-Caraban Conservation area.

Existing fauna will be monitored before and after predator control. It is expected that populations of the existing fauna, including the western brush wallaby, brushtail possum, quenda,



Left: The tamar wallaby is one of the native animals thought to have occurred around Gnangara before European settlement and one likely to be reintroduced under Western Shield.
Photo – Babs & Bert Wells/CALM



Below left: Paperbarks growing on the edge of Yeal Lake are part of the diverse flora already found in the proposed park.
Photo – Chris Garnett/CALM

honey possum, dunnart, echidna and possibly the chuditch, will begin to increase in numbers and range.

The next step will be the reintroduction of fauna once found in the area, but no longer present. Species likely to have been found around Gnangara include the numbat, chuditch, brush-tailed phascogale, tamar wallaby, quokka, rakali (water rat), boodies, woylie, dibbler, mardo and ring-tailed possum. Western Shield will then extend into the former pine plantation.

PEOPLE'S PARK

Gnangara Park, because of its size and its proximity to growing residential areas and the city, will be an important area for recreation and public use. The opportunity for people to experience both natural areas and open spaces

will also make it a destination for nature-based tourists.

The Concept Plan divides the park into six zones, each one focussing on the features of a particular area, with appropriate proposals for nature conservation, resource use, recreation and interpretation and heritage. The plan recognises existing recreation pursuits and proposes new facilities in the different zones, including a visitor

centre, new tracks for walking, cycling and horse riding, picnic sites, scenic drives and a lookout. Recreation opportunities in the coastal Wilbinga-Caraban zone, for example, include the development of walking tracks to the beach, with access roads and parking for conventional and four-wheel-drive vehicles. The main visitor centre and a key recreation site are proposed near Gnangara Road. All facilities and activities will be sensitive to the need to maintain the quality of the water mound and other environmental values.

This is a long-term plan, but CALM and others have already begun working to improve the plantation and State forest and to prepare for the transformation into Gnangara Park. Projects undertaken include the development of the first 46 kilometres of the Coastal Plain Walk Trail, which opened in 1997, and an agreement with Clean Up Australia 2001 to help clean up the study area.

Public comments on the Concept Plan will continue to shape future developments at Gnangara Park as it grows into a unique conservation and recreation park—a park for the people.



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Copies of the Concept Plan can be viewed at the CALM offices in Wanneroo and Como and at shire offices and libraries around Gnangara Park, or purchased from CALM for \$5.00 each plus postage.

Winner of the 1998 Alex Harris Medal for excellence in science and environment reporting.

LANDSCOPE

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What does the future hold for our karri forest? Research provides some interesting insights. See page 18.



The photographic excellence of WA team Babs and Bert Wells was driven by a love of the job. See page 10.



'Growing Gnangara Park', on page 35, continues the story of WA's largest proposed outer suburban native parkland.



Many WA women have played important roles in the conservation of our natural resources. Some of them feature in our story on page 41.



Partnerships are important. Many private sector businesses and individuals are active partners in protecting our natural heritage. See page 47.

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COVER

The Dampier collection returns briefly to Western Australia for an exhibition at the WA Museum. The specimens' scientific interest is limited, but their historical significance is immense. The illustration is of the *Sturt-pea*, and Dampier was the first person to collect this unusual but magnificent plant. (See page 28)

Illustration by Philippa Nikulinsky



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