



C. Winfield

Herdsman Lake:



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Inner City Sanctuary

JOHN BLYTH
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Early in 1988 all publicly owned land at Herdsman Lake will be declared an A-class Regional Park, and vested in the National Parks and Nature Conservation Authority 'to provide for the conservation of wildlife and public recreation through wildlife appreciation and observation, quiet enjoyment, education and scientific study'.

The Past

Aboriginals used the resources of *Ngurgenboro*, as they knew it, for at least 5 000 years before European occupation of W.A.. Like other lakes on the Swan Coastal Plain, it was an important source of protein in the form of frogs, tortoises, crustaceans and water fowl. The stems and roots of various wetland plants, including *yanget* or *cumbungi* (*Typha* species) were also a staple supply of carbohydrate.

Europeans quickly recognized other values of lakes such as Herdsman — water for stock, green feed in summer, and soil suitable for horticulture and agriculture. This led to some of the earliest conflicts between Europeans and Aboriginals.

Only scattered evidence now remains of the Aboriginal use of Herdsman Lake. Apparently, they rarely occupied low sites near the water's edge, but camped on the higher ridges around the northern and western edges of the lake, thus avoiding periodic flooding, and the nuisance of midges and mosquitoes. A lesson ignored in some residential developments around Perth.



Photo courtesy H. Shugg

Herdsman Lake in the early 1920s, prior to draining.



D. Meach-Hunter

Mourning skink (*Egernia luctuosa*). Herdsman Lake is one of the few places in the metropolitan area where this reptile still is found.

Early descriptive records of Herdsman Lake are sparse, but they suggest that the lake was more open and less choked by *Typha* early last century. It probably flooded to a depth of about 1 m in winter and dried out to muddy puddles late each summer. The total wetland was about 420 ha.

Since European settlement, Herdsman Lake has frequently been a centre of public debate and the subject of widely varied proposals. Plans for its use have included: grazing and horticulture, rubbish disposal, mining, drainage management, bisection by major roads, site for Perth's main airport, development as a deep lake for boating, and a golf course.

'Great Lake', as it was first known, was surveyed by J.S. Roe in 1837, at which time its name was formally changed to Lake Herdsman. Despite an early plan to drain Lake Monger into Lake Herdsman, little happened around the area until 1854, when a large land grant was made to a group of Benedictine Monks. They established a monastery, named New Subiaco, on the shores of Lake Monger, so providing the name of the existing suburb. By the turn of the century the

whole Herdsman area was owned by the Roman Catholic Church, presumably for grazing stock.

Surveyed in 1916, Herdsman's soils proved inferior to those of Osborne Park, which were made suitable for market gardening by draining into Herdsman Lake in 1912. Nevertheless, a Soldier Settlement Scheme commenced in 1920, with the acquisition of about 518 ha from the Roman Catholic Church.

In 1921 it was Herdsman's turn to be drained, by an ambitious and controversial scheme involving a tunnel over three kilometres long emptying into the sea near Floreat Beach. Subdivision and sale of blocks commenced in 1928, but the scheme was never successful; blocks sold slowly, there was continual flooding in winter, and soils were largely unsuitable for horticulture.

This abortive settlement scheme is the explanation for the long narrow blocks of private land radiating out around the edge of the lake. They were designed to take advantage of the seasonal inundation and drying of the lake bed, obviating the need for irrigation.

After the failure of the soldier

settlement scheme, Herdsman Lake was used for cattle grazing, opportunistic market gardening, and as a compensating basin for urban drainage throughout the 1940 s and 1950 s. Most of the land alienated by the settlement remained under freehold title. This became a matter of significance as pressures for development grew in the 1960s.

The Present

Herdsman Lake is far from being a pristine wetland. It has been exploited, often in ways detrimental to its ecological health, for many years.

The extent of changes is difficult to gauge, because of uncertainty about the original condition of the lake. We can be reasonably sure, however, that it now receives more nutrients, and that its vegetation has been modified by different patterns of flooding and burning, and by woodcutting and grazing, since settlement. Further, its hydrology now depends more on run-off from urban areas and the operation of artificial drains, than on the seasonal rise and fall of the water table.

As a response to these changes, there is now less open water, fewer paperbarks and banksias and much greater domination of the area by *Typha*.

On the other hand, despite its chequered history, Herdsman Lake still has very high value for conservation and passive recreation — value recognized recently by its entry to the register of the National Estate. It supports approximately 80 species of native birds on a regular basis, at least 10 species of reptiles and six species of frogs. This latter figure represents all the species of frogs likely to be found in lakes of the Swan Coastal Plain.

One species of native fish (the Swan River goby — *Pseudogobius olorum*) is present, and the lake also supports golden carp (*Carassius auratus*) and large populations of mosquito fish (*Gambusia affinis*).

The aquatic invertebrates are a key element in the food web of



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E. McCrumb

Very common on most wetlands, these Eurasian Coots (*Fulica atra*) dive for aquatic plants and also graze on the lawns.

Female Darter (*Anhinga melanogaster*), one of the species which needs deep water for diving.

Another bird capable of diving to several metres is the Musk Duck (*Biziura lobata*). This male shows the characteristic fleshy pouch.



D. Meach-Hunter.



D. Meach-Hunter.

the lake. They are little known, although about 50 recognisable species have been collected.

Thirty-two species of higher plants (eight introduced) and 48 species of algae have also been recorded in or around the lake.

Because it is near the centre of a major city, Herdsman Lake provides an outstanding opportunity for public enjoyment of wildlife. Its value for conservation, education and recreation is considerably heightened by the continuing loss of other wetlands of the Swan Coastal Plain — a loss estimated at 75 per cent over 15 years ago.

The importance of the lake for wildlife is confirmed by the World Wildlife Fund (WWF), the Royal Australasian Ornithologists' Union, and the W.A. Gould League. The Herdsman Lake Wildlife Centre, built with funds largely raised by WWF, was officially opened by the Premier in November 1984. It is managed by the W.A. Gould League, who first proposed the preservation of Herdsman Lake and the construction of a study centre for scientific and educational purposes in the early 1970s. The Wildlife Centre offers environmental education based on the lake's ecosystem. Over 7 000 school-children and members of the public used its resources last year, and the centre is still enlarging its scope.

The environmental values of Herdsman Lake were first officially recognised in a town-planning report in 1955, which recommended its reservation for Parks and Recreation. This recommendation was endorsed in a Metropolitan Region Planning Scheme in 1963. Much of the lake and its surrounds remained privately owned, however, and growing pressures for development competed with calls for conservation of the lake.

Herdsman Lake is a popular place for frogs. This one — the moaning frog (*Heleioporus eyrei*) — is fairly common on the Swan Coastal Plain.



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A flowering bullrush spike (*Typha*). This species dominates the shallower parts of the lake.



This hide for studying birds was built by Commonwealth Employment Scheme (CEP) workers for the State Planning Commission.

The Wildlife Study Centre on the edge of the lake.

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In response to these conflicting demands the Metropolitan Region Planning Authority produced the Herdsman Lake Concept Plan in 1976. The Plan provided the broad objectives of future management of the lake and its surrounds, but controversy continued. In January 1986 the State Planning Commission (SPC) announced a more detailed Improvement Plan. The legislation under which the Improvement Plan was enacted gives the SPC wide powers to implement the scheme, and it is intended to have the important elements completed by the end of 1987.

The Improvement Plan is a town planning scheme, and has to take into account many conflicting demands; it is not simply concerned with conservation.

Large areas of freehold land have been, or are being, bought back for inclusion in the Regional Park. Approval of development plans for private land is conditional upon developers ceding to the State all areas of wetland and foreshore that they own. Developers are also required to develop foreshores for conservation and recreation, and to carry out some dredging operations in the lake itself, to the specifications of the SPC.

One of the most controversial aspects of the Improvement Plan is the deep moat left after sand is extracted from peripheral areas of the lake bed. The sand provides firm foundations for buildings in housing and business estates around the lake. The peaty soil it replaces is used largely to fill foreshore areas prior to landscaping, and to backfill some of the deeper areas from which sand was extracted. Under the Improvement Plan, dredging to create the encircling moat is the only mining activity which will be permitted; all mining tenements will revert to the State once development is completed to the satisfaction of the SPC.

The SPC believes a moat will not only supply sand for

development around the lake, but is also the best way to protect wildlife because access (particularly by cats and dogs) can be controlled. By incorporating the construction of the moat (and the filling and landscaping of foreshores) in development proposals, much of the cost of establishing the Regional Park is borne by developers.

There is little doubt that the moat will help protect the inner wetland which makes up about 15 per cent of the inundated area. The combination of deeper channels, gently sloping shallows, and landscaped foreshores adjacent to housing estates will also increase the diversity of habitats available to water-birds.

During the two year period before declaration of the Regional Park, the Conservation and Land Management Department (CALM), as its eventual manager, will be engaged in discussions and negotiations with other agencies to ensure that the conservation values of the lake are protected.

CALM will contribute to the positioning and design of walk trails, viewing points and hides, as well as to the details of the dredging and landscaping, and the establishment of native vegetation. The main aims will be to ensure that habitats are available for the most diverse and interesting fauna possible, and that there is as much public access to the wildlife and habitats of the lake as is consistent with their protection.

Of course, the wildlife of Herdsman Lake encompasses much more than waterbirds, and education programs at the Wildlife Centre emphasise plants and invertebrates as well. Given the variety and visibility of water-birds at the lake, however, and their popular appeal, an emphasis upon this group is reasonable. A management regime which aims for large numbers and high diversity of birds, and gives maximum encouragement to some rare species, will inevitably protect

THE WAY AHEAD

The regional park will be a minimum of 304 ha. This will be made up as shown in the table below, and on the map.

Land-use in Proposed Herdsman Regional Park

Description	Area (ha)
Shallow central wetland (conservation)	158
Moat and lakes (protection of central wetland)	
shallow (< 2 m deep)	30
deep (7-8.5 m deep)	30
total	60
Foreshore and environs (buffer and 'passive recreation')	
grassland — reticulated and mown	14
— mown only	24
low-lying swampy areas and thickets of trees (including reforested areas)	48
total	86
Total area of proposed park	304

PROPOSED HERDSMAN REGIONAL PARK



other components of the ecosystem.

A number of contentious issues remain to be resolved. These include: ways of retaining acceptable water quality, and the influence upon this of urban drainage and the artificial deep lakes; control of the population of Argentine ants established in and around the lake; management of *Typha*; fire regimes; and finally, the management of midges and mosquitoes. Nevertheless, the resolution of these issues will be



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CEP workers constructed this walkway onto the lake. Being raised, it will not interfere with the flow of water. Paperbarks (*Melaleuca raphiophylla*) at the edge of the lake. These thickets provide roosting and nesting sites for birds. They can be destroyed by fire.

relatively simple, for several reasons.

First, the boundaries of the proposed Regional Park are established, and its primary purpose, the conservation of flora and fauna and compatible recreation, is not in dispute. Once vested, its use for other purposes, such as drainage, must not adversely affect the primary purpose. Thus, the aims of management of Herdsman Lake will be much more specific.

Secondly, before the changeover of responsibilities, a management plan will be produced. The public will be fully involved in the planning process.

Thirdly, powers under the Improvement Plan will ensure that satisfactory arrangements

are made for funding, water regimes and maintenance of high-use recreational areas.

Finally, one of the first initiatives by CALM, during the two-year transition period, will be to establish a Management Advisory Committee with representatives from a number of Government agencies, local authorities and community groups. Sub-committees would be established to deal with the details of specific issues.

Herdsman Lake helps to give Perth a flavour and lifestyle unique amongst Australian cities. It is superbly placed to provide 'nature-based' recreation, and for the development of public understanding of ecological systems and their conservation. The soon-to-be-developed legislation for the establishment of the Herdsman Regional Park should ensure that this important and popular wetland continues to serve the needs of both conservation and recreation.



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Landscape

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COVER PHOTO

A tender moment between human and whale shows the care which was a feature of the highly successful Augusta whale rescue.

Photo courtesy of the Western Mail.

A Conflict of Interests

Why are there so many conflicts when it comes to our natural environment? There is conflict among industrial groups exploiting natural resources; environmentalists advocating preservation of wildlife; government agencies; and recreation groups.

In an ideal world we would have a total understanding about ecosystems and natural resources, and of the long term needs of the community. But this is not an ideal world, and much of the conflict stems from a lack of agreement about environmental impact and human needs.

Take whale strandings for instance. From the time whales beach, tissue damage occurs due to a rise in body temperature and the sheer weight of the mammal. We don't know how long they have to lie there and how hot they have to get before the chances of survival are next to nil. Strandings may be part of a natural culling process or accidents caused by human impact on the environment.

And, what about the people who turn out in large numbers under often adverse conditions, and become so emotionally caught up in saving these creatures? What weight do we put on their need?

It is not an ideal world. We are a long way from knowing the answers to too many important questions.

There is a need for more investigation, better communication and a broader understanding of environmental processes and human needs.

This brings us to *Landscape* and its purpose. Its prime objective is to achieve an understanding about conservation of ecosystems and management of natural resources.

Landscape's aim is to provide expert information on the major conservation issues, latest developments, research in progress and general features of the State's wildlife, national and marine parks, nature reserves and forests.

It will give a balanced representation of viewpoints and will not shy from contentious issues.

Landscape will inform readers about the natural wonders of our environment, the management considerations involved and the lifestyle of its inhabitants. It will not provide all the answers, but it will present the facts and therefore a basis for sound argument.

Landscape is Western Australia's own conservation and wildlife magazine.

Wetlands

The theme for this year's World Environment Day has been 'Wetlands — Not just for the Birds'. In this issue of *Landscape* we feature the ecological importance of wetlands.