

## *A SWAMP FOR ALL SEASONS*

Bengier Swamp, 25 km north-east of Bunbury, is one of the State's most important wetlands for waterbird conservation. What is most unusual about Bengier is that it is also used for crop growing. CALM Planning Officer Susan Moore looks at the controversy surrounding Bengier and some of the difficult management decisions ahead.



Benger Swamp is like no other nature reserve in W.A. — its water levels are artificially controlled and the swamp bed is cultivated every summer. Why have such manipulative management? To understand that it is necessary to look at Benger's history.

## History

Over the 150 years of European settlement in the Benger area, the Swamp has been used for cattle grazing, potato and vegetable cropping, prisoner-of-war work camp, stick cutting and fodder cropping. Prior to this Aboriginals used the plentiful supply of food offered by the Swamp — waterbirds, frogs, tortoises and wetland plants.

Local Aboriginals referred to the place as 'Bengerup' (place of water) or 'Beenja' (big water). In April 1836, Governor Stirling, the first

European to explore the area, described it as a 'vast marsh and swampy plain, 2 miles long'.

By the 1890s the agricultural value of Benger Swamp had been recognised. Cattle were grazed on the dry Swamp bed over the summer months and by 1910 subterranean clover and water couch had been planted to provide pasture for stock. In the early 1900s the first potato crops were grown.

The 1910s was a decade of rapid expansion of the potato growing industry on Benger Swamp. The area was divided into 152 lots with an average size of 2-4 ha. As well as potatoes other vegetable crops such as peas, beans and maize were grown.

During World War II there was a lack of workers so the potatoes were harvested by prisoners-of-war. Under the

supervision of the Forests Department, the prisoners — known as the Civil Alien Corps — worked on the potato crops at Benger and Donnybrook.

By the 1960s only a small percentage of the Swamp was still being used for potato growing. Despite several irrigation trials Benger could not compete with the better potato-growing areas around Manjimup.

To enable crops to be grown and harvested before flooding in late May, the Swamp was drained in early December. To allow drainage (and facilitate filling) of the Swamp, and to prevent flooding of adjacent low-lying ground, a complex network of levees and drains was constructed. Thus, water levels on the Swamp have been artificially controlled for most of this century. During this time the Swamp was reduced from over 1000 ha to 570 ha.

The main drain at Benger Swamp.



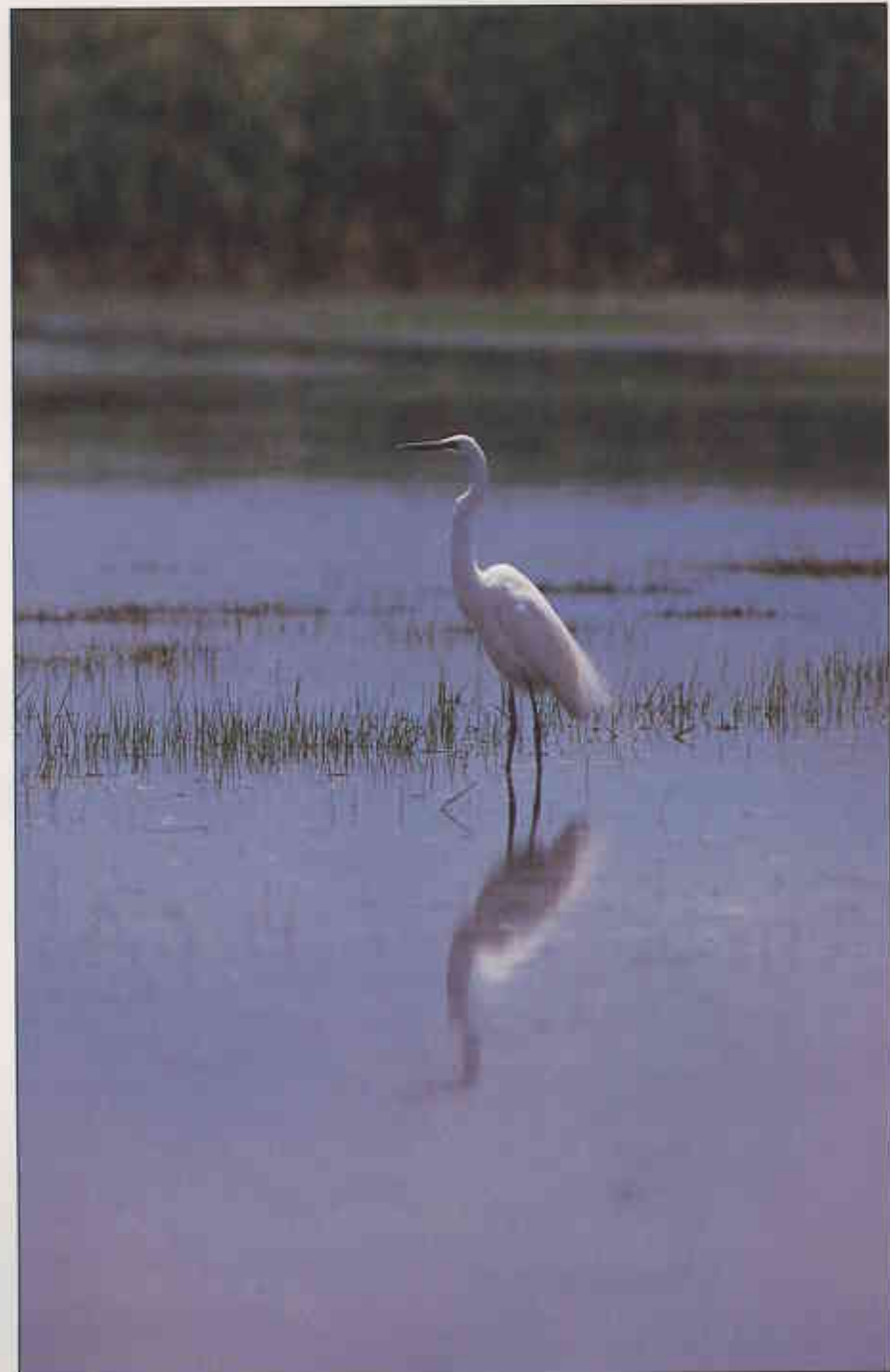
Agriculture also led to a number of other changes. The 200 ha cropped between 1920 and 1960 were treated with fertilizers and insecticides such as DDT. The native vegetation was cleared or disturbed. There was invasion by exotic species, particularly the rush *Typha orientalis* (bulrush) which several botanists believe to have been introduced with European settlement. Fires were used to clear parts of the Swamp prior to ploughing. The introduced *Typha* stands rapidly regenerated from its underground roots, but many of the native melaleucas were killed. The melaleucas are particularly important as they provide nesting areas for a number of waterbirds, including the Freckled Duck.

Benger Swamp is ranked, by the Royal Australasian Ornithologists' Union, as one of the top ten wetlands in south-western Australia. They observed over 3000 birds in November 1982 and 43000 in December 1985, with a total of 50 waterbird species — including 12 that were breeding. The Swamp is also one of nine known areas in south-western Australia where Freckled Ducks breed. The Freckled Duck is considered rare and in need of special protection in W.A., and is fully protected in all Australian States.

The conservation values of the Swamp were highlighted by honorary game warden Reg Taylor, who kept detailed records of waterbird use of the Swamp between 1957 and 1969. During the 1950s he regularly observed 2000-3000 ducks on the Swamp. Among these ducks was the rare and endangered Freckled Duck. He



Cliff Winfield



Cliff Winfield

Damselfly (top).

Great Egret (*Egretta alba*).





The Sacred Ibis (*Threskiornis molucca*) takes flight from Benger Swamp (left).

A swamp for all seasons: the same spot during winter; prior to planting; and planted with the fodder crop sudax (below).

Looking like the inspiration for a painting of the Heidelberg School, these dairy cattle graze peacefully near Benger (bottom).

Criff Winfield



Doug Watkins



Doug Watkins



Doug Watkins



Doug Watkins

studied their nesting and made an important contribution to our knowledge of this species. This information provided the basis for purchase of 56 ha of the Swamp in 1973, by the then Department of Fisheries and Fauna.

## Habitat Requirements

The Swamp provides a range of habitats, both at one point in time, and through-out the year. In the former case, the Swamp offers open water or mudflats or grasslands (depending on the time of year), bulrush stands and melaleuca thickets and forest. Over the year a range of water levels, across all three major habitat types, is provided — from deep water (usually 70 cm) to drying mud flats. Areas of open water are particularly important as they provide landing and refuge areas, as well as feeding grounds, for numerous waterfowl.

## The Need for Manipulative Management

Benger Swamp is an example of the dilemma of managing an environment that has been severely disturbed; an environment that nevertheless has very high conservation values.

Integrated management is essential to deal with pressing issues such as bulrush control and duck shooting. Management decisions must also take into account complex land tenure.

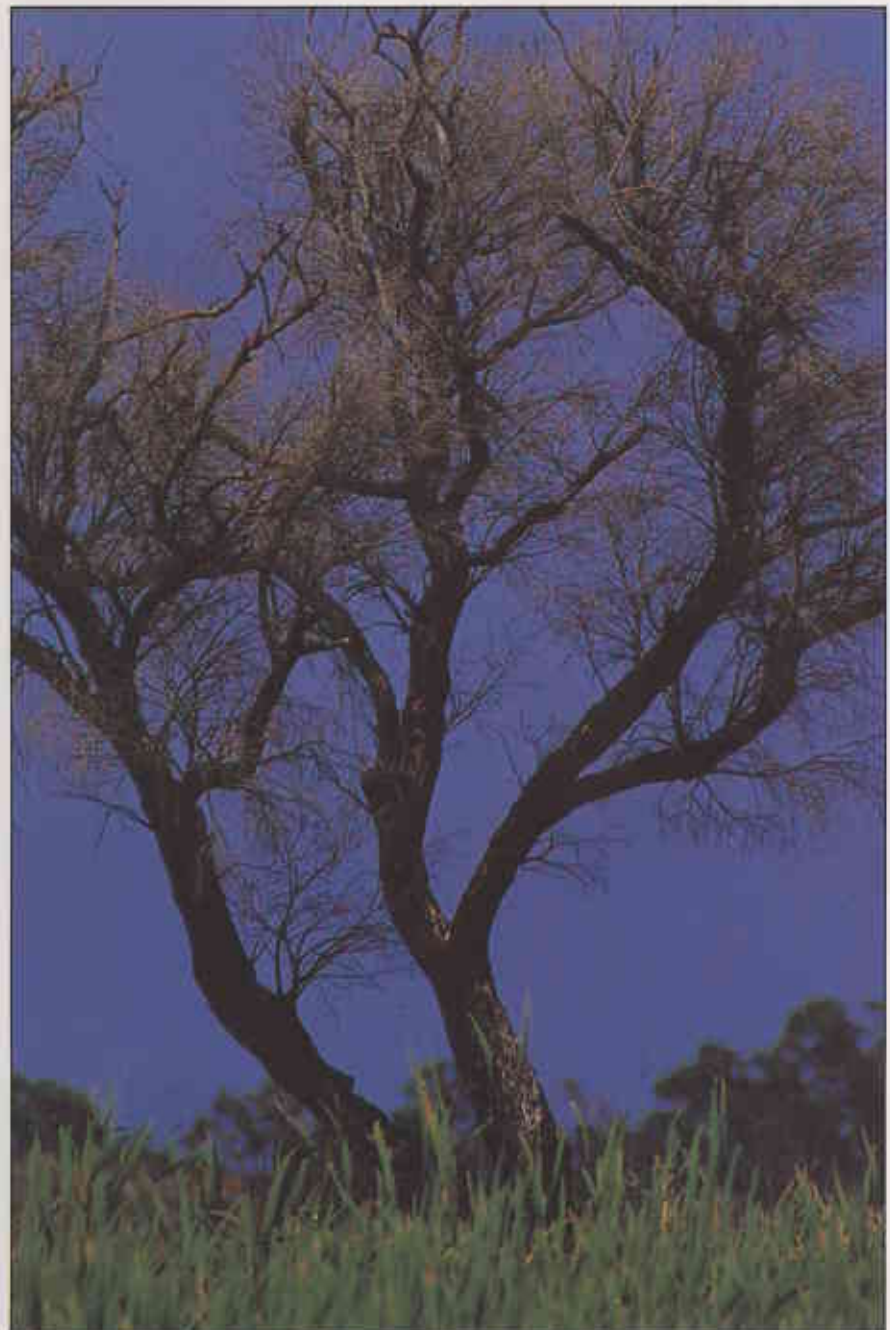
It is essential to control the spread of bulrushes, which currently cover 50 per cent of the Swamp. If control measures are not implemented, they are likely to spread and

cover the remaining 20 per cent of open water.

At present, ploughing and subsequent cultivation of open areas of the Swamp appears to be the most effective and economic method of controlling the spread of bulrushes. There are two possible approaches to cultivation — either employing contractors or leasing parts of the Swamp to local farmers. Leasing parts of the Swamp to local farmers, for fodder cropping, creates few costs for CALM and provides a small return to local farmers who undertake the work.

This has significant implications for drainage. If fodder crops are grown the Swamp can be left to dry naturally, as their short growing season allows harvesting before the Swamp floods in June. Vegetable crops on the other hand have longer growing seasons requiring that the Swamp is dry and ready for cultivation by mid-January.

Over the last 10-15 years the date of commencement of drainage has been based on the need to retain water in the Swamp for as long as possible to provide waterbird habitat and the need to have the



A burnt *Melaleuca raphiophylla*.

Doug Watkins



Swamp dry by mid-January so cropping can commence. It should be noted that if the Swamp was left to dry naturally it would only take an extra six to eight weeks to dry.

This artificial drainage regime has led to expressions of concern, particularly in recent years, that the Swamp's value as a refuge is being fore-shortened by a number of weeks and its values as a breeding area are being similarly affected. To assess the effects of leaving the Swamp to dry naturally the draft management plan proposes that the Swamp be divided into two compartments, north and south. The northern compartment will be drained so it is dry by mid-January, and the southern compartment will be allowed to dry naturally. This proposal will enable the Department to determine whether more waterbirds will use the Swamp if the entire area is allowed to dry naturally and if there are any adverse effects (e.g. increased salinity)

that may be associated with natural drying.

Water level management is made more complex by the range of land ownerships on the Swamp. Eighty-seven per cent of the Swamp is controlled by CALM, with 13 per cent under private ownership. A portion of this privately owned land is used for vegetable cropping, requiring that the Swamp be dry by mid-January. Allowing the southern compartment to dry naturally will not result in land-use conflict as all privately owned land lies in the northern compartment.

Benger Swamp has been used for many years for duck shooting. Over the last couple of years concern has mounted that duck shooting, although strictly controlled, may be threatening the Freckled Ducks at Benger. In December 1986 the Minister for Conservation and Land Management closed Benger Swamp to duck shooters for the 1987 season.

To achieve integrated

management and clarify management direction a draft management plan was prepared and released for public comment in December 1986. The public submission period associated with the draft plan provides an opportunity for those interested to comment.

Successful management of Benger Swamp for waterbird conservation is dependent on intelligent professional decisions and ongoing local support.

Copies of the draft plan are available for your comment. □

Write to:

Di Johns

Department of Conservation  
and Land Management  
50 Hayman Road  
COMO WA 6152

Phone: Di Johns, 367 0481

---

The rare and endangered Freckled Duck (*Stictonetta naevosa*).



# Landscape

Volume 2 No. 3  
Autumn Edition/March 1987

Contents	Page
Home On The Range <i>by Dr Barry Wilson</i> .....	3
Garden For Wildlife <i>by Robert Powell</i> .....	9
Diplomats From Day One: W.A.'s Stromatolites .....	11
Urban Antics — A Haunting in Suburbia <i>by Andrew Cribb</i> .....	15
Exploits At Icy Creek .....	16
A Year In Lilliput <i>by Grant Wardell-Johnson</i> .....	17
The Writing on the Wall <i>by Howard McNickle</i> .....	22
The Nostalgic Naturalist <i>by Old Timer</i> .....	28
Wildfire <i>by Colleen Henry-Hall</i> .....	29
Gimlets and Gold — The Story of Kalgoorlie's Woodlines <i>by Cliff Winfield</i> .....	34
A Swamp For All Seasons <i>by Susan Moore</i> .....	41
Letters .....	47



Published by Dr. S. Shea, Executive Director, Department of Conservation and Land Management, 50 Hayman Road, Como, W.A. 6152.

Executive Editor: Sweton Stewart  
Editor: Liana Christensen  
Designer: Trish Ryder

All Maps by Department of Conservation and Land Management Mapping Section

Offset plates by Photolitho-PM  
Typesetting by Printworks

Printed in Western Australia by the Department of Services, State Printing Division, ISSN 0815-4465.

© All material copyright. No part of the contents of the publication may be reproduced without the consent of the publishers.

## Editorial

W.A. is a vast, sparsely populated State, and it is not uncommon to hear some parts of it described as 'the last frontier'. But there are few, if any, parts of W.A. that have not been affected by European settlement.

Evidence of western civilization in some of the most remote areas is far too often the empty can. But even where there are no obvious traces, the effects have been profound.

There is compelling evidence, for example, that the displacement of Aboriginal communities from much of inland W.A. — and the subsequent removal of Aboriginal firing practices — is directly responsible for major changes in vegetation, which in turn has resulted in the virtual extinction of many native animals.

It is not always easy to pick the effects of European civilization on the natural environment even when the history is well-documented. This *Landscape's* account of the woodlands around Kalgoorlie talks about the often horrific environmental damage, but an observer of these woodlands today would have difficulty recognizing that vast areas were clearfelled less than 50 years ago.

While the concept that we should 'let nature do its thing' has superficial appeal, the reality is that the purity of nature has been, and will continue to be, distorted by human presence. We have no option if we want to sustain the unique ecosystems of W.A. but to apply management principles.

The history and management problems of Benger Swamp, which feature in this edition, illustrates two fundamental points. Firstly, even the most disturbed areas of W.A. can make a major contribution to conservation. Secondly, we must be careful not to change a system that works even though the way it works may not be 'natural'.

As complex and as difficult as the task of understanding ecosystems is, the social and political factors which influence the type of management that can be applied are often more difficult to deal with.

The key to good management is an understanding of the processes that drive the ecosystem. Once we understand what the natural processes are, we can then devise management systems which will mimic them.

The only way to ensure that rational decisions are made on environmental management is to provide the facts.

## COVER PHOTO

Just when you thought you had seen every angle on our State symbol, photographer Jiri Lochman surprises you with a fresh perspective.