



HAVEN IN THE HEART

BY BARRY WILSON

It's right in the heart of the city ... one of Western Australia's newest marine parks. The Swan Estuary (inaccurately known as the Swan River) is a rather harsh aquatic environment in many respects, but it supports an abundant fauna in the summer months when it becomes inundated with seawater.

THREE portions of the central estuary basin called Melville Water have been reserved this year as marine parks under the Conservation and Land Management Act. They are at Alfred Cove, Pelican Point and Milyu Beach (beside the freeway at Como), and they are to be known collectively as the Swan Estuary Marine Park.

These areas have special importance as feeding and resting habitat for water birds. As well as having many resident species, these estuarine shores provide significant habitat for a dozen or more species of migratory waders which fly down from their Arctic breeding grounds to our region during the southern summer months.

Alfred Cove is especially important, because there is a narrow nature reserve along its shore. Here, many land birds feed and nest among the trees and shrubs. At high tide, water birds shelter among swampy reed beds and samphires. Solitary white egrets stand motionless in shallow pools, watching for unwary fish to come close enough to provide breakfast. At low tide, flocks of long-legged waders spread out to feed along the shore and out on the exposed muddy flats.

WINTER SCOURS

The Swan Estuary is unusual in that it alternates from summer saline to winter fresh conditions. Every winter the floods come down the Avon and Canning Rivers and scour the estuary with fresh water, leaving only pockets of stagnating seawater at the bottom of the deeper basins. Animals

and plants adapted to live in salt water have different responses to this massive annual change in their environment.

Many fish, prawns and crabs simply swim out of the estuary into the sea when the floods come. But most sedentary invertebrates, especially those like mussels and barnacles which live attached to the bottom sediments, are unable to escape. They must remain where they are and cope with the change if they can.

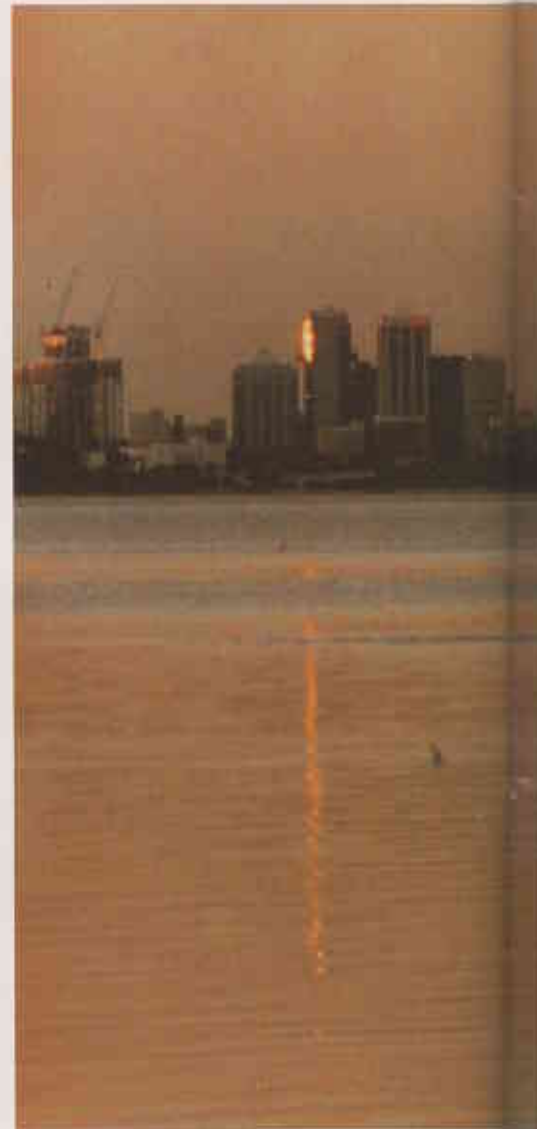
The burrowers, for example, can dig deep into the bottom sediments and go into an inactive state until the water again becomes salty. Shelled species can close up to keep the unsuitable water out of their bodies. Many of the Swan Estuary invertebrates have a remarkable ability to survive for long weeks of inactivity in these severely stressful conditions. Others, like the blue mussel, which invade the estuary as juveniles in the salty summer, are unable to cope and suffer heavy mortality during the winter floods.

In early spring the flow of fresh water into the estuary abates, and the ocean tides begin to push salty seawater back up the estuary. By October in most years seawater has penetrated as far upstream as the Narrows Bridge. Marine animals invade the nutrient-rich estuary once more, and the residents which survived the winter floods begin to breed and flourish. There is a sudden bloom of plankton and bottom-living creatures. In the shallows around the shores, especially on the intertidal mud and sand flats, countless billions of tiny molluscs, worms and crustaceans multiply.

LANDFALL

A month or so earlier, wading birds in distant Arctic Russia and northern China and Japan anticipate this renewal of life in the Swan Estuary and other wetlands of southern Australia. With their new season's young, they form vast flocks, and set off on a remarkable journey to the Antipodes. Some of these birds are no longer than your thumb. They fly up to 11 000 kilometres, with but a few stops along the way, down the coast of Asia, making a landfall on the northern coast of Australia in spring.

The wide and biologically rich mudflats of Roebuck Bay in northern WA are a particularly important landfall for many of these trans-equatorial migrants (see *LANDSCOPE*, Autumn 1986). They arrive there emaciated and exhausted, but they feed on the flats for several days and soon



regain weight. Many of them then continue south to important feeding grounds - among them Alfred Cove, Milyu and Pelican Point.

These birds are truly citizens of the world. By birth they may be Russian, Chinese or Mongolian; yet their ancestors have been coming to the Swan Estuary for countless generations, and we must surely think of them as being Australian too. How they navigate such a long and hazardous journey remains a mystery. How this extraordinary migratory route was first established is beyond imagination.

Australia has signed treaties with Japan and China to protect these birds and their habitats, and a treaty is currently being negotiated with the USSR. If these amazing creatures are to continue living on our planet it is necessary to protect

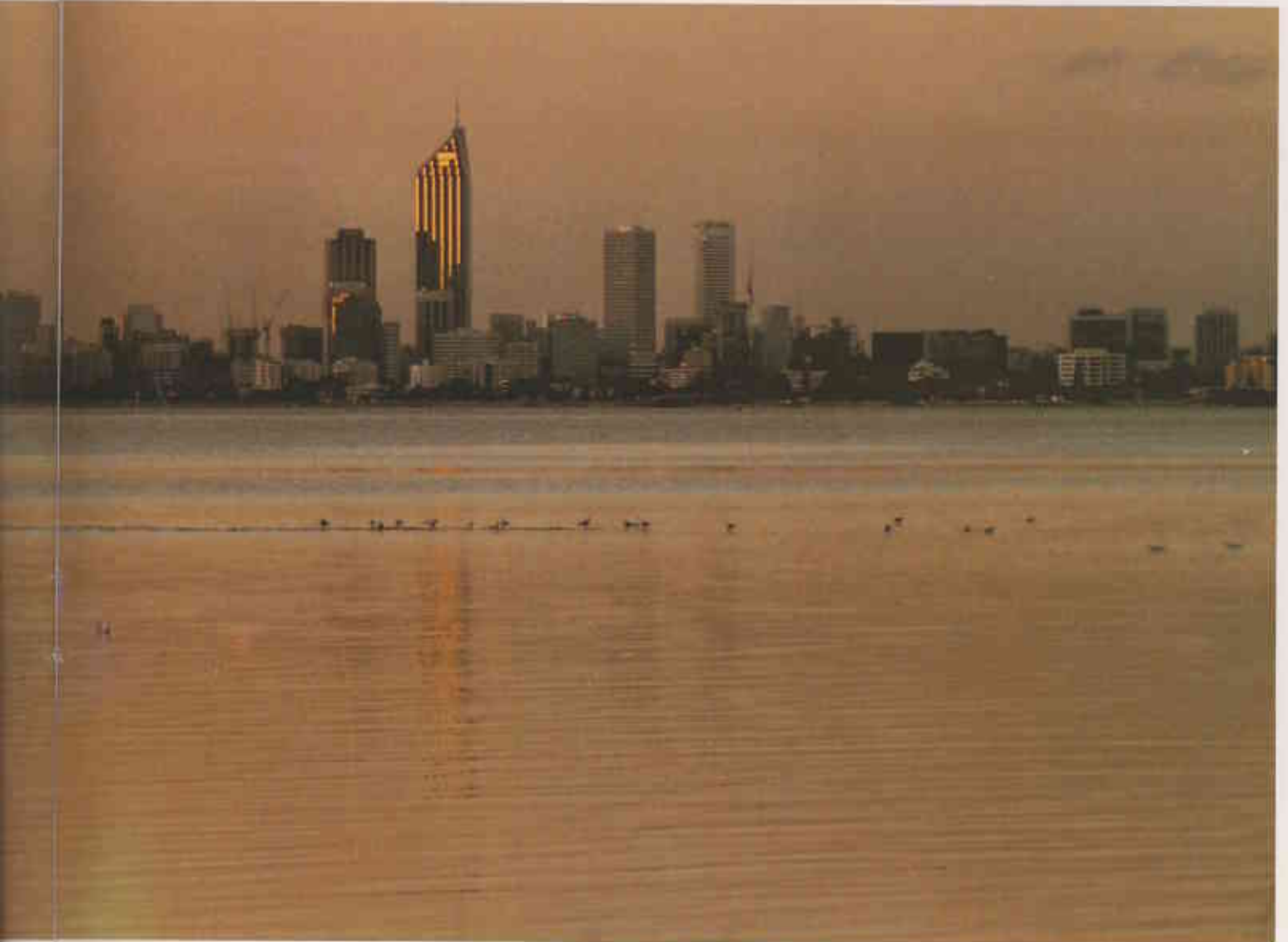


Two Ibis, *Threskiornis aethiopica*, enjoy the serenity (and the lawn beetles) of parks adjacent to the marine park at Alfred Cove.
Photo - Bill Advic ◀◀

Australian pelicans, *Pelecanus conspicillatus*, are frequent users of the marine park.
Photo - Kerry Cook ◀

At high tide, sea birds rest on the remaining exposed sand on the flats, secure from disturbance, even in the heart of the city.
Photo - Bill Advic ▼

Photo previous page - John Green





An elegant Great Egret, *Egretta alba*, quietly hunts for breakfast.
Photo - John Green ◀

Migratory waders, including Great Knots, *Calidris tenuirostris*, Bar-tailed Godwits, *Limos lapponica*, and Grey Plovers, *Pluvialis squatarola*, rest in the serenity of Alfred Cove.
Photo - John Green ▼

their habitat at both ends of their migratory route. The Australian share of this responsibility is to look after the southern feeding grounds.

GUARDING THE TERRITORY

Protecting the birds and reserving their habitat are first steps. The difficult part will be to manage the habitat so that it continues to sustain the birds in perpetuity. In this case, managing the ecosystem may seem particularly difficult, as it is surrounded by a large and busy city. Now that these marine parks have been declared, we must devise management plans which will ensure that the objectives are met.

Broadly speaking, three matters need attention. First, the intertidal flats and their fringing vegetation must be protected against physical damage; this has been ensured by reservation. Second, human activity must be constrained so that the

birds are not unduly disturbed. Third, the waters must be kept unpolluted.

The human activities in the area most likely to disturb the birds while they are feeding are swimming, sailing, wind-surfing, and jet-skiing. Hand-trawling for prawns in the shallows may damage the birds' feeding grounds. And people stumbling about in the swampy areas near the shore can disturb the birds during their essential resting periods between low tides. Conflicts of these kinds can probably be avoided by zoning the reserves to keep these activities away from the areas most used by the birds. Most people will respect the zoning and accept that the birds deserve a fair go.

Potentially the greatest threat to the reserve habitats is pollution and consequent collapse of the ecosystem upon which the birds depend. Preventing pollution from drains entering the reserve is probably easily achieved by negotiating

with the adjacent local government authorities. The main threat is from pollution of the whole estuary, of which the marine park is a part. It is not possible to manage the ecosystems of the reserved areas in isolation. Preventing industrial contamination is not a great problem; pollution-prevention measures introduced some years ago by the Swan River Management Authority have so far kept the estuary healthy and free of poisons. The greatest concern is the possibility of deadly eutrophication, resulting from nutrient-loaded river runoff from the catchments.

THE CITY AND THE PLANET

A management plan will soon be prepared for the three components of the Swan Estuary Marine Park. Management of the whole estuary is the responsibility of the Swan River Trust, but the health of the estuarine ecosystem will also depend on effective administration of the State's powerful environmental protection legislation in the catchment beyond the shores of the estuary itself.

Maintenance of the estuarine mudflats upon which the birds depend requires that Perth people (you and I) put fewer poisons down our drains and fewer nutrients on our lawns, and that the land in the Avon and Canning catchments is wisely managed. Looking after reserves is not enough: we must care for the whole estuarine environment and its catchments. The cost and effort required are not only for the benefit of the migratory birds. The Swan Estuary is human habitat, too.

The story of the migratory birds makes another point. By caring for the ecosystem of our own Swan Estuary we have a direct, positive effect on an ecosystem on the opposite side of the globe.

At a recent public lecture in Perth Canadian environmentalist David Suzuki reminded us to "think globally and act locally". To a greater or lesser extent, the ecosystems of our planet are all interconnected. Proper care of Alfred Cove will be a small and local task, but it will have a global consequence. ◻

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LANDSCOPE

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COVER

Back in the early 1970s, Western Australia proclaimed the numbat (*Myrmecobius fasciatus*) as its State emblem which may have saved its life. With the help of scientists and new techniques, these delightful creatures are now fighting back against extinction. See page 15.

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