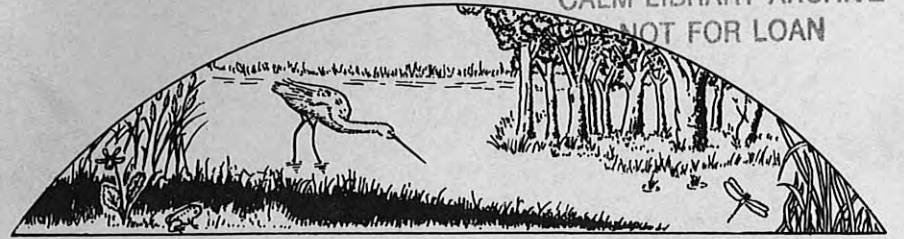


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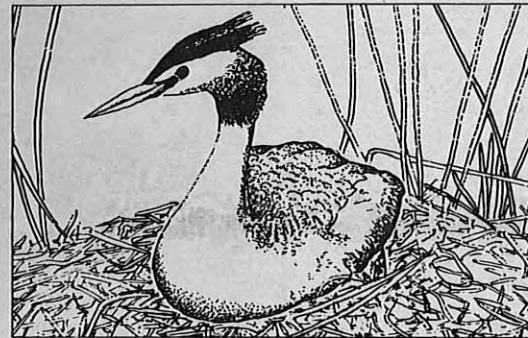
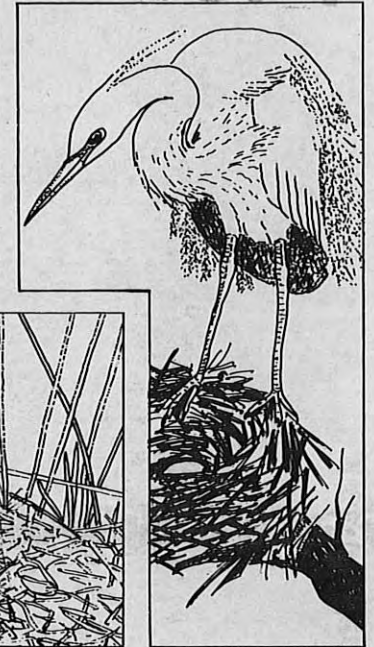
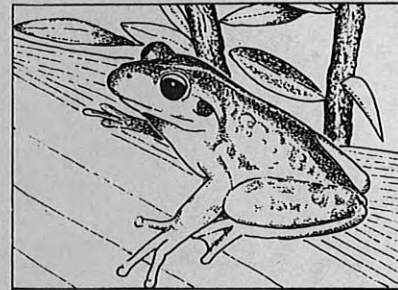
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Exploring Coastal Wetlands

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Exploring Coastal Wetlands



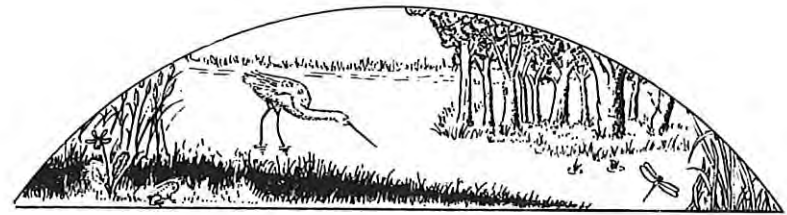
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50 Hayman Road,

Como, W.A. 6152.

P.O. Box 104, Como, W.A. 6152.

(09) 367 0333



Exploring Coastal Wetlands

Introduction

Coastal wetlands, islands of water in our dry, hot land, lie in a string along the coast, from Moore River to Busselton.

These areas, where ground water meets ground surface, support an intricately balanced ecosystem where hundreds of plant and animal species depend on each other for food and shelter.

About 30 species of migratory waterbirds (waders) come to these wetlands, flying thousands of kilometres, fleeing the cold northern winter. They visit wetlands such as Thomsons Lake and Forrestdale Lake, and the Swan River, in search of food. They will stay here and on other wetlands throughout W.A. until they know it is time to return north to breed.

Wetlands also are a filtering system, removing sediment and nutrients from runoff water before it flows into other waterways.

This booklet is a short guide to coastal wetlands, the plants and animals that live there, and the systems that make up a wetland ecosystem.

A wetland can be a lake, an estuary, a pond or a river; there is no typical wetland, nor a single definition of 'wetland', but the processes and the plants and animals described in this booklet are true of most coastal wetlands in the Swan Coastal Plain.

A Vanishing Act

Thousands of years ago, the entire coastal plain, stretching from Geraldton, south to Busselton, was a vast swampy area. Over the years, climate and landforms changed. The swamp shrank in size, and individual wetlands appeared. Since the arrival of Europeans 150 years ago, the number of wetlands has become fewer as land has been drained and developed.

What's A Wetland?

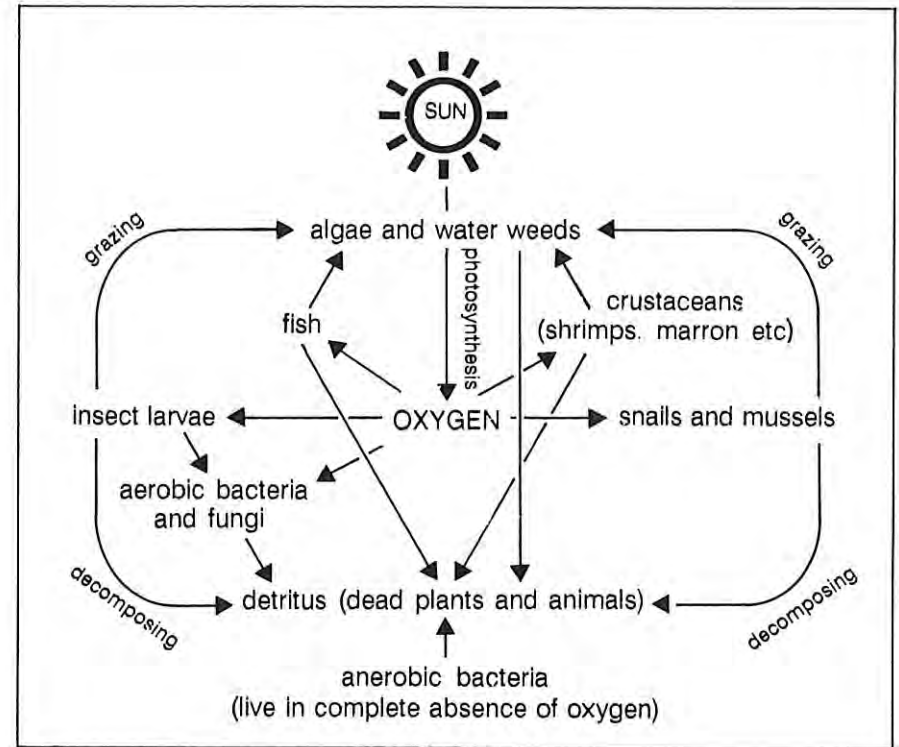
A wetland, at its most basic definition, is land covered by water. The land may be covered all year, may dry up with the seasons, or be covered twice a day with the changing tides. The water may be fresh or salty. These land and water qualities influence the plants that grow in a wetland, which influence what animals live there.

The wetlands of the Swan Coastal Plain are generally shallow, sometimes drying out during the long, hot summers. As they dry they provide ideal conditions for all sorts of birds and animals.

On The Water, On The Wing, On The Land

Wetlands support communities of billions of plants and animals, some too small to see with the naked eye.

Plants get energy to grow and reproduce from the sun. When these plants die, bacteria and other microorganisms decompose them. Other animals eat these animals. The plants, and therefore the energy of the sun, have been cycled into a food chain that affects all levels of animal life.



Oxygen Cycle

It is a delicately balanced system, linked so that any significant change to any part can affect the whole. Some changes might be so small they pass unnoticed, but there is always a reaction.

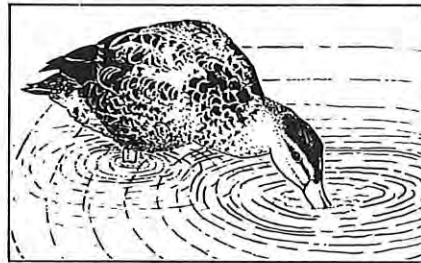
For example, if the natural vegetation on the edge of the wetland is replaced with lawn, which is usually fertilised, nutrients will enter the water. Under certain conditions, large amounts of nutrients can cause a population explosion of algae. The number of midges, which feed on the algae, increases, but the number of insect predators that feed on midges does not increase as fast. The wetland's ecological balance has been disturbed.

Exploring The Wetland

Starting at the centre of the wetland, where the water is deepest, and moving gradually to shore then out to the farthest edge of the wetland, let's explore and discover the wetland's plants and animals.

Some wetland plants, such as algae, grow underwater, providing food and oxygen to the animals that live in the water and food for some species of ducks, grebes, coots and other waterbirds.

The Pacific Black Duck (*Anas superciliosus*) and the Black Swan (*Cygnus atratus*) paddle through the water, upending and reaching to feed on these small plants. These two species eat similar types of food, but the Swan, with its much longer neck, feeds on plants at depths of up to 1m, while the Duck cannot reach beyond about 30cm.



Pacific Black Duck

You may see diving birds such as cormorants and grebes in these deeper waters. These birds have webbed feet and legs that are set well back for easy swimming to the bottom of the lake where they forage for food.

Australian Pelicans (*Pelecanus conspicillatus*) swim in groups, driving fish together in front of them before diving and scooping.

Profile of 'ideal' wetlands showing waterbird habitats



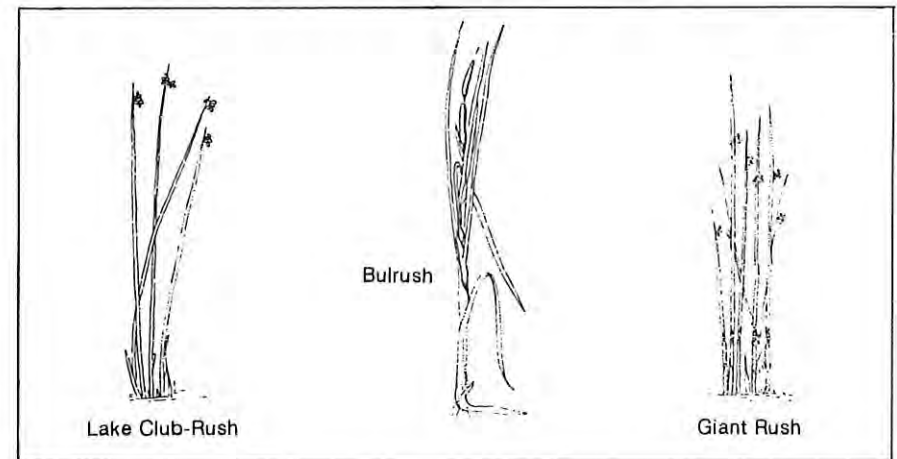
Shallow Water and Shore

Closer to shore where the water is more shallow some plants grow partly in and partly out of the water. Sedges and rushes form a belt of vegetation between the land and the water. This area is covered and uncovered as the water level changes with the seasons. These plants store much of their food in the roots and bulbs, and Aborigines used them for food.

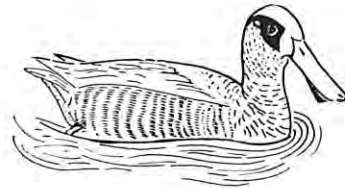
The jointed twig rush (*Baumea articulata*), lake club rush (*Schoenoplectus validus*), and giant rush (*Juncus pallidus*) grow where the ground is seldom dry.

In shallower areas and where the ground sometimes dries out in summer, the bulrush (*Typha orientalis*) with its long strap-like leaves, is abundant, particularly where the ground has been disturbed. The bare twig rush (*B. juncea*) also grows here.

Mudflats and shallow areas not covered by sedges and rushes may be colonised by grasses such as water couch (*Paspalum vaginatum*). Depending on how salty the area is, samphire marshes are also very common around mudflats of wetlands.



In the shallow waters the Pink-eared Duck (*Malacorhynchus membranaceus*) filters minute invertebrates from the water with its specialised bill.

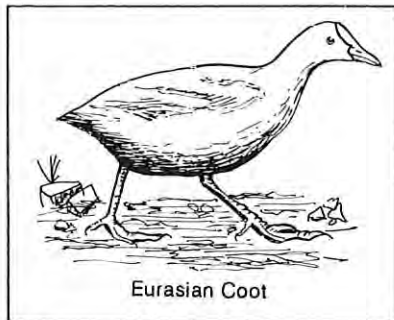


Pink-Eared Duck

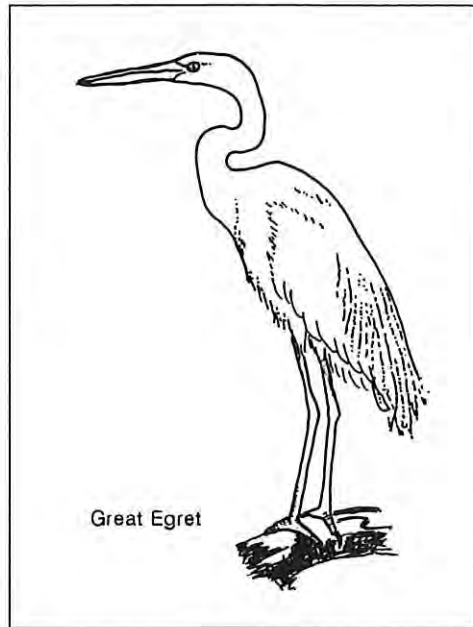
The Great Egret (*Egretta alba*) with a bill designed for spearing fish, steps delicately through the shallow waters, while the ever watchful White-faced Heron, (*Ardea novaehollandiae*) silently stalks its prey.

Eurasian Coots (*Fulica atra*) have separately webbed toes ideal for high stepping through the mud and water. The wading water-birds walk and probe in different depths depending on the lengths of their legs and bills. Small waders usually use the moist mudflats, which is why drying lakes are good habitats for them.

The sedges and rushes around the water's edge are roosting and nesting sites for waterbirds, and the Ciamorous Reed-Warbler (*Acrocephalus stentoreus*) prefers the shelter of rushes for nesting.

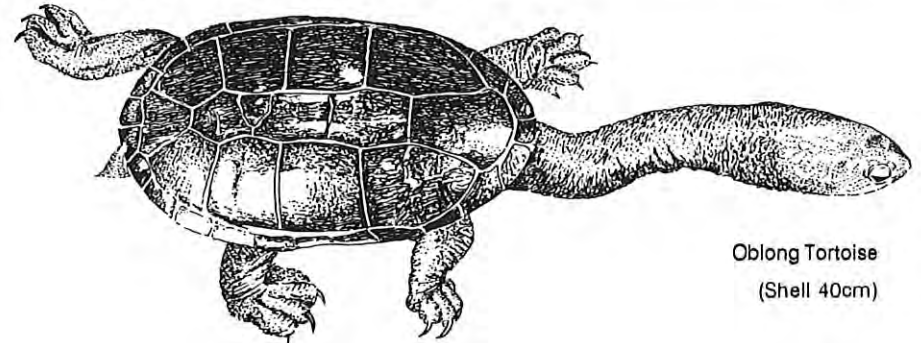


Eurasian Coot



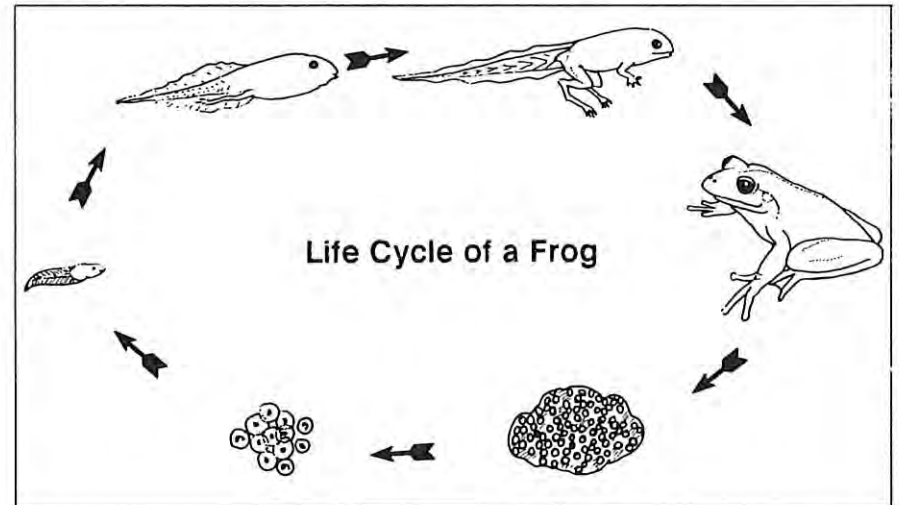
Great Egret

The oblong tortoise (*Chelodina oblonga*) is a long-necked tortoise common in and around many of the Swan Coastal Plain wetlands. This species is found only in the south-west corner of W.A. You may see it in the water or scurrying on its webbed feet across the ground, its long head and neck stretched straight in front of its shell (or carapace). The colour of shells varies from bluish-grey to mottled olive and brown.



Oblong Tortoise
(Shell 40cm)

Tadpoles, found in the wetland's shallow, still waters, can often be seen in various stages of transformation. The adult frog dwells on land, but still needs a moist environment.

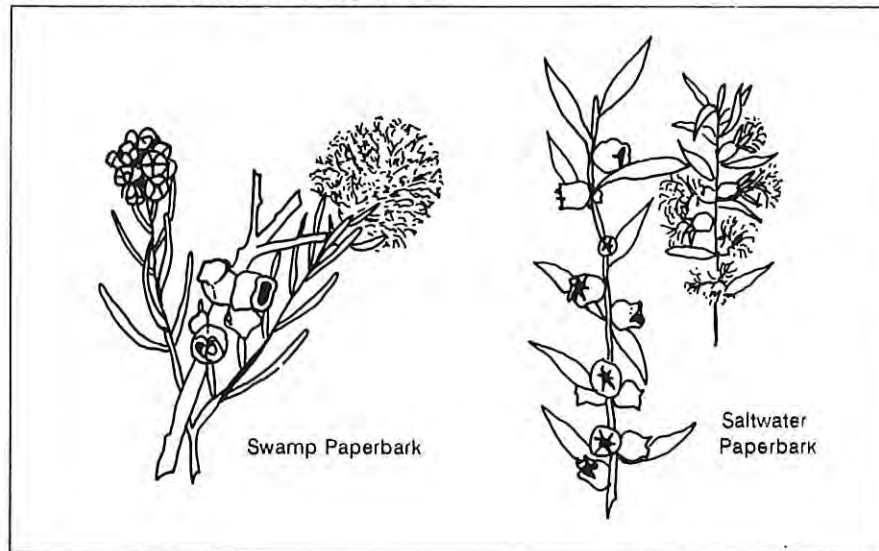


The whoops, moans, trills and rattles of frogs can be heard at night, when they are most active. They shelter under debris, rocks and vegetation or in burrows. Frogs feed mainly on insects, but also eat other frogs, fish and other invertebrates.

With plenty of practice, a bit of luck and a torch, you can find these colourful creatures by following their calls. Carefully replace anything you remove or you could destroy their habitat and breeding places.

RING OF TREES

Often fringing the wetland are trees that can tolerate water, like the saltwater paperbarks (*Melaleuca preissiana*) and swamp paperbarks (*M. raphiopylla*). These are also known as tea-tree because of the colour the water is stained by their leaves. The trees may form dense woodland, with few plants underneath apart from sedges or samphire.

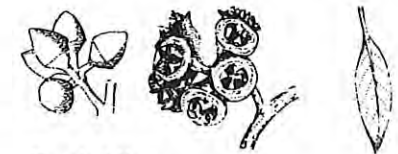


The rare Freckled Duck (*Stictonetta naevosa*) nests just above water level amongst the branches of dense shrubs or tree thickets; the Great Egret and the White-faced Heron roost here too.

For birds that live on land, food is abundant amongst the paperbarks, especially in pools left as the water recedes, which contain breeding insects. Inland Thornbills (*Acanthiza apicalis*) feed on insects on these trees, while Grey Fantails (*Rhipidura fuliginosa*) feed mid-flight. The Fantail's jerky movements disturb insects. Its spinning, looping aerial antics are fun to watch.

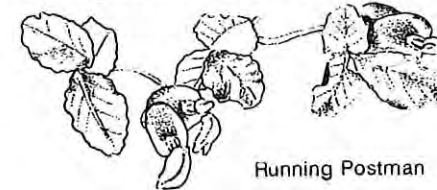
On Higher Ground

Just above where the water reaches in winter, you find flooded gum (*Eucalyptus rudis*) and swamp banksia (*Banksia littoralis*). Farther from the water the firewood banksia (*B. menziesii*) and the slender banksia (*B. attenuata*) grow.

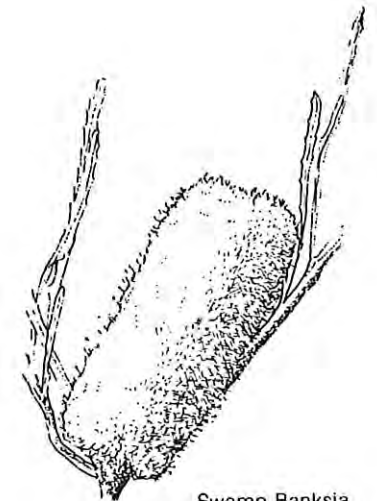


Flooded Gum

The bright red flowers of the running postman (*Kennedia prostrata*) in the spring are like flags, alerting you to its presence close to the ground, among stands of flooded gums.

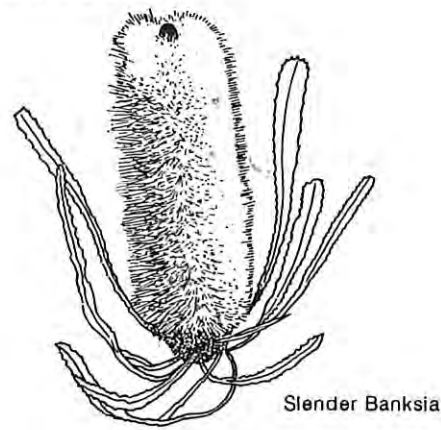


Running Postman

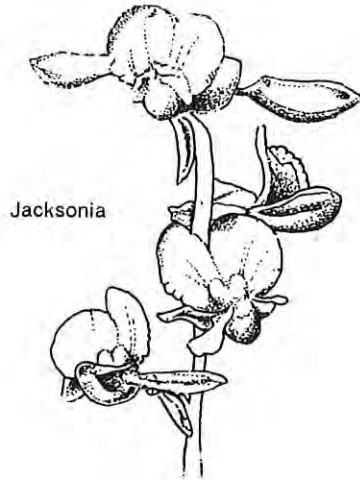


Swamp Banksia

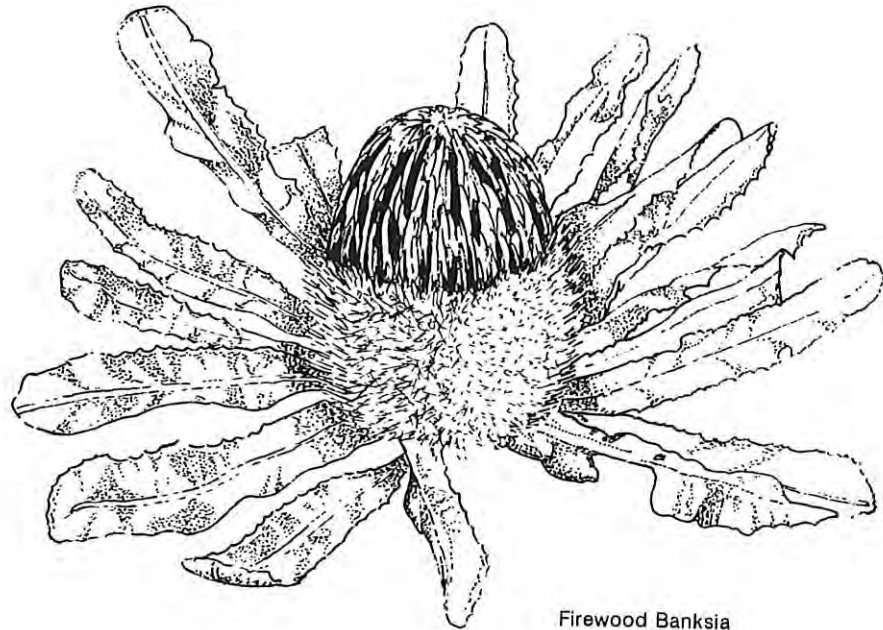
On the edge of, or in, the banksia stands are the *Jacksonia* species *J. furcellata* and *J. sternbergiana*, often called stinkwood. Both have yellow and orange-centred pea flowers and appear leafless. *J. sternbergiana* is a tall weeping plant, and *J. furcellata* a short shrub.



Slender Banksia



Jacksonia



Firewood Banksia

A bird found in thick scrub, especially near wetlands, is the brilliant, glossy violet-blue male Splendid Fairy-wren (*Malurus splendens*). The Yellow-rumped Thornbill (*Acanthiza chrysorhoa*) prefers open ground such as fields where it too hunts for insects. This inquisitive little bird will often investigate if you enter its territory.



Cowslip Orchid

In open woodland, well above the water line, are the bright yellow faces of cowslip orchids (*Caladenia flava*) in spring. Look carefully and you could see other delicate orchids.

The fluffy heads of the native foxtail mulga grass (*Neurachne alpecuroidea*) are a familiar sight. The dryer areas are home to invasive introduced grasses such as veldt grass (*Ehrata calycina*), wild oats (*E. longiflora*) and many other weeds, which can overrun the native plants.



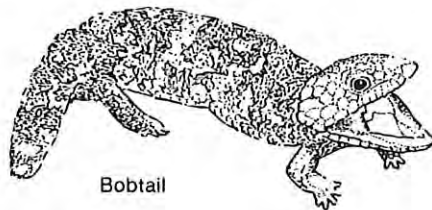
Foxtail Mulga Grass



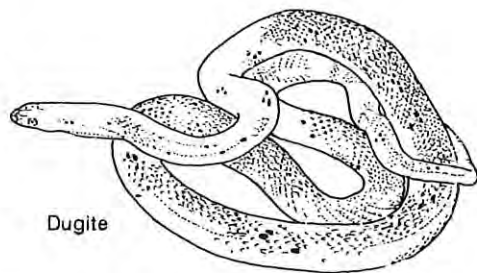
Veldt Grass

Lizards are common here. Geckos have broad toe pads and large eyes with vertical pupils well adapted for nocturnal life. Most other lizards are more likely to be seen during daylight hours in warm weather. Look for them sunning themselves on rocks or fallen branches.

Skinks are one of the largest family of lizards in the world. They are typically small and slender, have shiny scales and are secretive inhabitants of leaf litter. The commonly seen bobtail (*Tiliqua rugosa*), with its stumpy tail and frightening blue-black tongue that is used to scare predators, is an unusually large skink.



Bobtail



Dugite

Snakes like to bask in the sun to heat their bodies.

The dugite (*Pseudonaja affinis*) and the black tiger snake (*Notechis scutatus occidentalis*) are common around wetlands during the warmer months. Black tiger snakes are occasionally seen swimming through wetlands. Waterbirds watch them very carefully, and the fuss the birds make can often alert you to the presence of a snake in the water. These animals use a potent venom to immobilise their prey of frogs, small mammals and other reptiles. Be careful because they may strike at you if they feel threatened.

Birds of prey, the Swamp Harrier (*Circus aeruginosus*) and Nankeen Kestrel (*Falco cenchroides*) soar and hover, watching and waiting to strike at small reptiles and mammals, insects, and birds.

Watch a Wetland

A comfortable spot, a pair of binoculars, this booklet and an informed friend or reference book can add greatly to your understanding and appreciation of our wetland plants and animals.

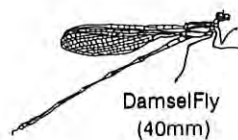
Discover what's happening at a wetland close to where you live by keeping notes and making sketches. An example of how you could record your observations is on the next page.

You could discover daily changes in how birds and insects behave; weekly changes as different types of birds move in and out of the wetland; or seasonal changes as the temperature and water level vary.

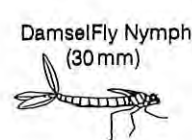
Regular observation can provide insights into special adaptations and behaviour. Many different species of birds are able to live here together, thanks to these adaptations. A close look will reveal a bewildering array of beaks, necks, legs, feet and bodies. Some have beaks that are long and thin, or short and flat. They may have long or short legs and webbed or lobed toes. Each bird has special features that enable it to collect food that other birds can't catch, or feed in places others can't reach.

Put a hand lens to a scoop of wetland water and what do you see? A hidden world inhabited by strange-looking creatures that are really microscopic crustacea or insect larvae and pupae. These creatures will grow into dragonflies, damselflies, mayflies, caddis flies, beetles or bugs.

Find a special spot, get comfortable and look at the colours, listen for the sounds, and smell the odours of the wetland.



Damselfly
(40mm)



Damselfly Nymph
(30mm)



Mayfly (8mm)




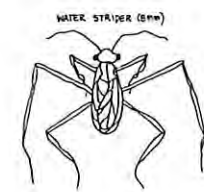
Water Boatman
(10mm)


PLACE: Forrestdale Lake
 cleared area at end of Moore Street
SITE:
DATE: 25th January, 1987
TIME: 5:55 - 7:07 pm
WEATHER: cloudy, warm & humid, gentle breeze
OBSERVATIONS: seems low, about 10m exposed mudflats
WATER LEVEL: I waded out about 15m, water was only up to my calves. Very slimy mud below toes.
PLANTS: red banksias flowering, attracting numerous insects. lot of weed in water, noticed small snails on the weed. Bulrushes seed is blowing towards town.


ANIMALS: thousands of midges. Better remember to read this before my next visit so I don't forget the 'rid' or to put a net over my hat to keep them from getting up my nose and in my mouth. Hundreds of birds - Susans swimming & resting in middle. ducks. lots of tiny brown speckled birds feeding around edges - in a group. run very quickly.

HUMAN IMPACTS: met a nice lady who is a keen bird watcher. She told me that a lot of the birds are migrants that have travelled from the northern hemisphere. She also told me that the little birds that caught my eye are called **Red-Necked Stilts**. Bit of litter about - looks like someone had a picnic. Cleaned it up. Saw what look like dog prints in the mud. Look out birds!

WHIRLIGIG BEETLE (3mm)


WATER STRIDER (8mm)


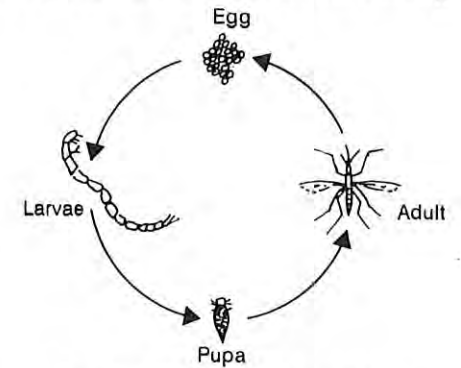




What's Bugging You?

If you live next to a wetland, you know about the plagues of tiny insects in the summer. Mosquitoes are a nuisance, but with the aid of our insect repellants, we've learnt to live with them. Midges look a lot like mosquitoes but unlike the blood-sucking mosquitoes, they don't bite.

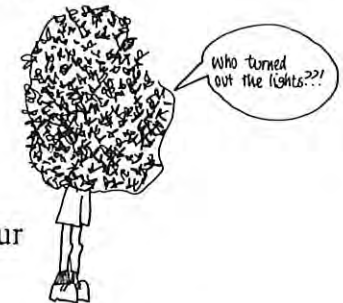
Adult midges live only for a couple of days, during which time they mate in swarms. Females lay the eggs on the water or at the water's edge, and the larvae hatch and in weeks become adults, beginning the cycle again.



Life Cycle of a Midge

Many urban wetlands are sprayed with chemicals to kill midge larvae. This can reduce the adult nuisance, but the effects are only temporary. Some other organisms are killed and all the long-term effects of the chemicals on the environment are not known. We could try to live with midges for the short time they are a problem. Here are a few ideas for helping reduce the nuisance:

- install lights that don't attract insects
- don't use outside lights
- shade interior lights
- use insect screens
- plant trees and bushes between your house and the wetland.



Caring for our Wetlands

Protecting our wetlands for wildlife and for the future requires everyone's help now.

Not only the immediate wetland area needs care and protection, but the whole area from which water drains, called the water catchment. Our daily activities can affect the wetlands. For example, high groundwater consumption and the resulting drop in groundwater levels can cause a drop in wetland water levels. Fertiliser for our lawns and vegetables washes easily through the sands of the coastal plain and often ends up in the lakes and swamps. These high levels of nutrients can cause an algae population explosion, which can choke a wetland.

Helping Out

Here are some ways you can help save our wetlands:

Plant native

Native plants need less water and fertiliser. By planting native, you not only cut down on the time and costs involved in watering and fertilising, but also help reduce the demand on our precious ground water resources. You also provide homes for our native birds and animals. Native gardens are just as attractive as exotic gardens, grow quickly and require less maintenance.

Keep an eye on your pets

A walk or run in a public park can be just as good for your dog as a run around a wetland. Dogs love to chase birds and while the odds are in the birds' favour, no one likes to be disturbed in the middle of a siesta, a relaxing meal, or during a wash. Cats also chase and feed on birds and small animals, so keep your pets well fed.

Adopt a wetland

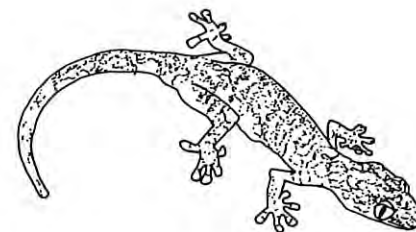
Keep a special patch of wetland free of rubbish and weeds, and watch for others not so caring.

Watch for fires in summer

Notify the nearest volunteer fire brigade if a fire is sighted.

Change your watering habits

By following guidelines set by the WA Water Authority you can save watering time (you'll have more leisure time), save money (reduce your water bill), save our precious water resources (help save our wetlands) and still have an attractive garden. Water in the early morning or evening when water evaporates less quickly. Use a broom instead of water to clean footpaths and driveways.



Want to Know More?

Contact your local wetlands interest group, or pick up one or more the books listed below.

GENERAL

Seddon, G., (1972), *Sense of Place*, U.W.A Press.

BIRDS

Pizzey, G., (1980), *A Field Guide to the Birds of Australia*, William Collins Sons & Co. Ltd., Sydney.

Simpson, K. and Day, N., (1984), *The Birds of Australia*, Lloyd O'Neil Pty Ltd, Melbourne.

AQUATIC ORGANISMS

Main, A. R. and Edward, D. H., (1968), *A Guide for Naturalists*, W.A. Naturalists' Club Perth.

William, W.D., (1980), *Australian Freshwater Life*, MacMillan, Melbourne.

FROGS

Tyler, J.J., Smith, L. A. and Johnstone, R. E., (1984), *Frogs of Western Australia*, W.A. Museum.

LIZARDS

Storr, G. M., Smith, L. A. and Johnstone, R. E., (1981), *Lizards of Western Australia*, U.W.A. Press with W.A. Museum.

PLANTS

Erickson, R., George, A. S., Marchant, N. G. and Morcombe, M. K., (1973), *Flowers and Plants of Western Australia*, A. H. and A. W. Reed, Sydney.

Marchant, N. G., Wheeler, J. R., Rye, B. L., Bennet, E. M., Lander, N. S. and Macfarlane, T. D., (1987), *Flora of the Perth Region. Parts One and Two*, W.A. Herbarium, Department of Conservation and Land Management.

Major Wetlands in and around Perth

Loch McNess, Yanchep National Park

picnic areas; kiosk; wildlife enclosures; boat hire; caves; nature trails; modified environment with opportunity to experience the bush.

Jandabup Lake, Jandabup

bush setting; good spot to see tortoises, reptiles, birds and to explore the bush.

Lake Joondalup, Joondalup

bush areas; has water birds not usually found in metropolitan area.

Herdsmen Lake, Churchlands

picnic area; Herdsmen Lake Wildlife Centre; boardwalk; bird hides; walk trail; modified environment, but opportunity to see semi-natural area.

Star Swamp, North Beach

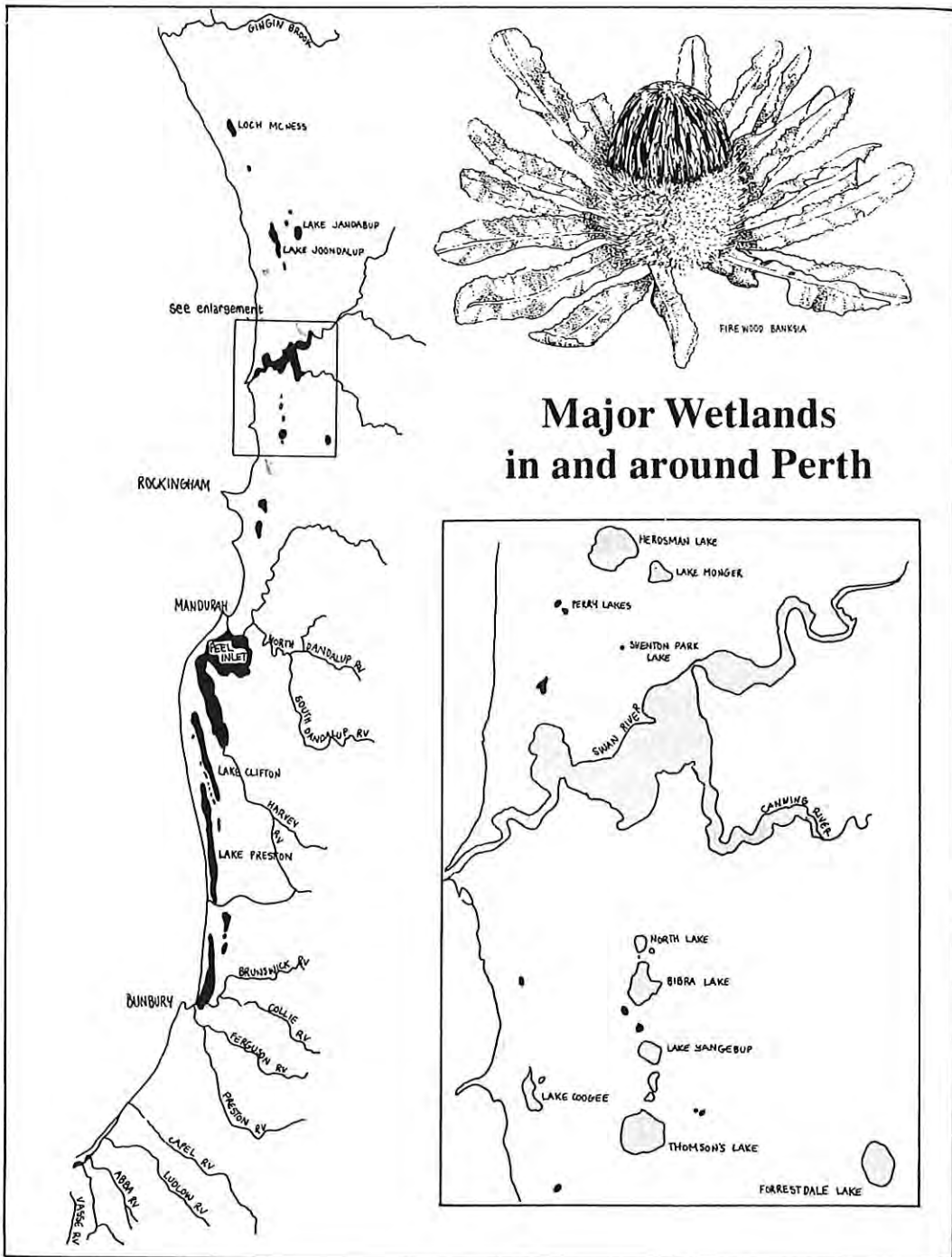
open woodland; popular spot for teaching, bushwalking and bird-watching.

Lake Monger, Leederville

picnic and recreation area; bicycle/walk trail; large population of swans and variety of water bird species.

Swan River

variety of environments from highly modified through to natural; wading bird habitat at Alfred Cove, Attadale.



Major Wetlands in and around Perth

North Lake, Murdoch

semi-permanent; wooded areas, cleared areas; important summer refuge for water birds.

Bibra Lake, Bibra Lake

mostly open water; semi-permanent; extensive paperbarks and other woodland; important summer refuge areas.

Yangebup Lake, Yangebup

little vegetation; variety of waterbirds.

Thomsons Lake, Success

belt of sedgeland; open scrub and woodland; walk trail; semi-permanent water body; important summer refuge area.

Forrestdale Lake, Forrestdale

semi-permanent waterbody; banksia, flooded gum, paperbark woodland; important summer refuge areas.

AUTHORS:

Jennifer Bartle, Gil Field,

ARTWORK:

Matt Cavana, Jennifer Bartle

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