SWANS

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The State Wildlife Authority News Service (SWANS) is issued by direction of the Hon. R. C. Old, M.L.A. Minister for Fisheries and Wildlife.

Director of Fisheries and Wildlife B. K. Bowen, B.Sc.

The support of the public is an essential component in any conservation or reserve management programme—but an informed, educated public is needed to ensure its continuing success.

This publication is designed as a medium by which the various organisations, individuals, and wildlife management personnel may be kept informed of the work being carried out by this department, of departmental policies and directions: and for promoting a better understanding and appreciation of Western Australian wildlife and the role it plays in maintaining a suitable environment in which man can live.

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COVER PHOTO

The Splendid fairy-wren is only one of many species of birds which have found homes in the Gingilup Swamps Reserve — see story on page 21.
(Photo—Copyright A. G. Wells)

Lake Development Near City Yields Scoop for World Wildlife Fund

by B.A. and A.G. Wells (All photos copyright A.G. Wells)

Springtime in Western Australia attracts from interstate and from overseas many tourists who come to see our unique wildflowers. Almost unnoticed however, is the arrival of hundred of thousands of visiting birds from the northern hemisphere, migrants without passports, who stop-over for about six months to enjoy our Mediterranean-like climate, then to return after the summer to their far-away homes.

This prodigious migration includes about twenty-nine species of small birds of the family Charadriidae, which leave their breeding grounds in the northern and arctic regions of Europe and Asia, and fly some thousands of kilometres, to arrive in Australia about September.

These species include sandpiper, stint, plover, whimbrel, redshank, greenshank, snipe, ruff, knot, turnstone, sanderling, curlew and godwit — all names to conjure with in the mind of the bird observer.

Of these, the smallest, rarest, and the least recorded, is the Long-toed Stint *(Calidris subminuta)*, which breeds in eastern Siberia, and otherwise lives around freshwater swamps in south-east Asia. In a way which is not understood, small numbers of this species become attached to the main seasonal migration to the south. It is the only species which appears to have a preference for the south-western corner of Australia as its summer haunt.

The two colour photographs, shown here, of the Long-toed Stint, are believed to be the first ever published, probably in the entire western world, and certainly in Australia.

Perhaps of greater importance is that they were taken by the authors on drying mudflats artificially created in the development of "Floreat Waters", as part of the overall environmental plan for Herdsman Lake, which is only a few kilometres from the heart of the City.

It is also significant that the location was adjacent to the site of the Herdsman Lake Wildlife Centre, an educational study centre which is being constructed under the aegis of the World Wildlife Fund Australia, and for which currently there is an appeal for public support.

Shunning the inter-tidal saltwater zones frequented by many of its close relatives, the Long-toed Stint is likely to be found on the drying margins of mud-bottomed shallow freshwater lakes. The virtually dry summers and comparatively mild

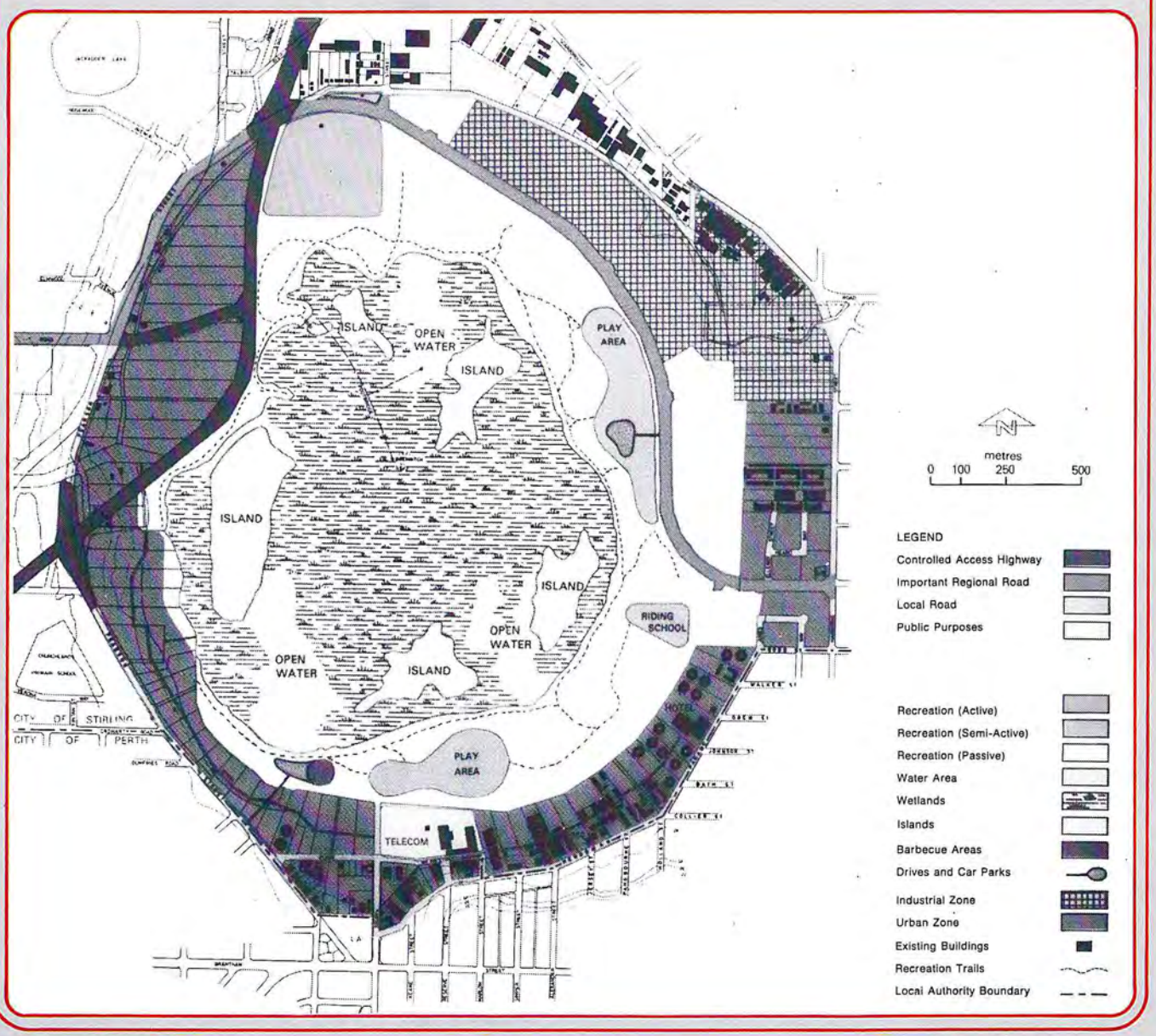
▼ Long-toed Stint *(Calidris subminuta)* characteristically in company with sharp-tailed sandpipers. Note the greenish-yellow leg.

Herdsman Lake Concept Plan

Herdsman Lake located to the north of the City of Perth is a major component in the extensive chain of wetlands running parallel to the coast. Because of its relatively close location to the city centre, its size and ease of access, and its natural attractiveness to wildlife, particularly birdlife, the lake has considerable conservation importance.

The degree of interest shown by the public in the future of the lake and the need to re-examine the road network in the area led to the formation of a Technical Advisory Committee to advise the Metropolitan Region Planning Authority on the planning and development of the lake area. The resulting concept plan which is shown below with the permission of the MRPA, provides for a total parks and recreation area of 340.7 hectares of which 178.8 hectares is made up of open water, wetlands and islands. Provision is also made for areas of passive and active recreation.

In addition, the lake will boast Australia's first nature study centre giving the public access to a new bird and wildlife sanctuary. An appeal was launched last year to raise funds for the building of the centre which is expected to cost $400 000. A spokesman for the World Wildlife Fund which organised the appeal, said the centre would provide special wildlife exhibits and a sheltered rooftop observatory would give visitors a view of the wildlife wonders of this unique wetland. The centre would complement educational facilities at the zoo in South Perth, Kings Park and other reserves.



climate of the south-west of Western Australia provide a particularly reliable area of receding lake margins during the northern winter.

Even so, this tiny, shy, cryptically coloured bird was virtually unknown until the last decade. Only occasional sightings of a few individuals had been recorded. As a result of recently increased research and studies of our diminishing wetlands, some larger numbers have been seen, including one flock of about 80 birds. Generally however, the Long-toed Stint occurs in very much smaller numbers.

Sighting and positive identification in the field can be made only with the aid of good binoculars or a field telescope. The Long-toed Stint may then be seen either as a solitary individual, or in a small group, often in the company of other members of its genus, particularly the Sharp-tailed Sandpiper *(C. acuminata)* (see plate). It bears a strong resemblance to this species, except for its smaller size, comparative lengths being 150 mm and 210 mm.

Identification is also confused by its similarity in size and profile to another close relative, the Red-necked Stint *(C. ruficollis)*, which, to make things even more difficult, migrates in enormously greater numbers.

However, the legs of the Long-toed Stint are distinctly greenish-yellow, while those of the Red-necked Stint are black. The Long-toed Stint also appears to be somewhat darker and brownish, whereas the latter species tends to be greyish, in their respective non-breeding plumages whilst in Australia.

Three specimens of each of these two species were measured at the Western Australian Museum, as follows:

	length of tarsus	length of middle-toe & claw
Long-toed Stint *(C. subminuta)*	1. 22.0 mm 2. 22.0 mm 3. 22.0 mm	23.0 mm 23.0 mm 24.0 mm
Red-necked Stint *(C. ruficollis)*	1. 19.5 mm 2. 19.0 mm 3. 20.0 mm	19.0 mm 19.0 mm 20.5 mm

These figures suggest that the actual difference between the lengths of the middle-toe and claw of the two species is only marginal. However, biologist Peter Curry has observed

▼ Four long-toed stints in a typical furtive posture, behind a small tuft of dead reeds, and about to take flight.

▼ Red-necked Stint *(C. ruflicollis)* Also occurs on the mudflats of Herdsman Lake and is easily confused with the Long-toed Stint. It has black legs.

◀ Red-kneed Plover *(Charadrius cinctus).* One of the three non-migratory small waders frequently seen on the margins of Herdsman Lake.

◀ Red - capped Plover *(C. ruficapillus).* Another non-migratory wader seen on Herdsman Lake.

▲ Black-fronted Plover *(C. melanops).*

that the combination in the Long-toed Stint of its relatively longer toes and legs with its slightly shorter body and tail, means that in flight, with legs retracted, the tips of the feet can be seen to project behind the tail, which seems to be a unique feature in the small sandpipers.

There are also noticeable differences in behaviour, which can be helpful to distinguish these two species in the field. The Red-necked Stint is usually in dense flocks of sometimes hundreds, even thousands, either running about busily and noisily feeding on saltwater tidal mudflats or sandy shores, or flying low in tightly packed well-disciplined groups, constantly changing direction and shape, until they land again, often not far from the observer. Examples of areas near Perth which are favoured by the Red-necked Stint, are the foreshore of the Swan River during low tides at Como, Alfred Cove and Pelican Point.

On the other hand, the Long-toed Stint, in its very much smaller numbers, is inclined to feed slowly and less industriously on freshwater mudflats (Herdsman Lake, Lake Yangebup, Thomsons Lake etc.). When disturbed it either runs quickly to cover behind a small clump of grass or reeds or it takes to the air with a fast bat-like flight, calling sharply as it flies high and often far away from the observer.

About April, the long summer holiday in Australia ends. Unseen by most people, a general exodus of migratory waders occurs and nearly all of the visitors return to their breeding grounds in the northern hemisphere.

Three other species of small waders which frequent the same location at Herdsman Lake were the Red-kneed Plover *(Charadrius cinctus)* Red-capped Plover *(C. ruficapillus)* Black-fronted Plover *(C. melanops).*
Although these are of a genus related to the Long-toed Stint, they are non-migratory, being full-time residents throughout most of Australia.

For the camera enthusiast, the photographs of the birds shown here were taken with a Leitz Telyt 400 mm telephoto lens with extension rings fitted to a Nikon F2 camera, hand-held with a gunstock, using Kodachrome 64 colour reversal film. Only two frames of the Long-toed Stint were obtained during the exercise, which extended over three weeks, indicative of the elusive behaviour of this unusual species.

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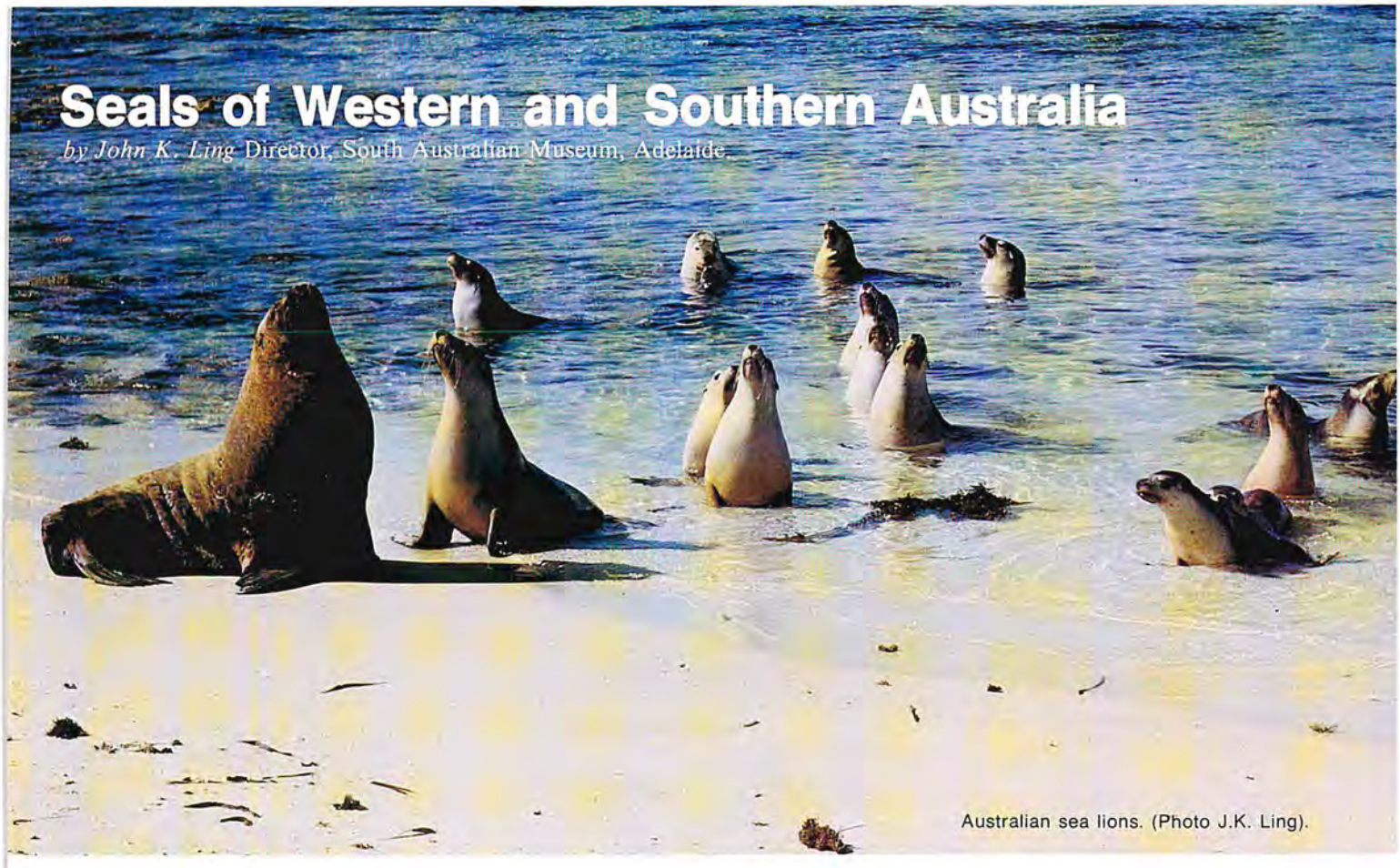
Roger Jaensch, Field Officer, Royal Australasian Ornithologists Union.

Peter Curry, Consultant Biologist.

Grant Pearson, Technical Officer, Western Australian Wildlife Research Centre, Department of Fisheries and Wildlife.

Seals of Western and Southern Australia

by John K. Ling Director, South Australian Museum, Adelaide.



Australian sea lions. (Photo J.K. Ling).

Two species of seals reside and breed in the western half of Australia: the Australian sea lion, *Neophoca cinerea,* and the New Zealand fur seal, *Arctocephalus forsteri.* Both are eared seals — family Otariidae — of the order Carnivora. There are two other orders: Odobenidae, the Artic walrus; and Phocidae, the earless seals. A few stragglers of the latter group visit southern Australian coasts from Subantarctic islands and the Antarctic Continent, but none breed in Australian waters, i.e. not today; elephant seals did at the beginning of the nineteenth century.

Seals used to be classified in their own order Pinnipedia (= fin-footed) on account of the obvious modification of their limbs, particularly the hands and feet, into flippers for aquatic locomotion. Fur seals and sea lions can bend their hind flippers at right angles to the body enabling them to "walk" on all fours, with a kind of shambling gait. They are quite agile on land and fur seals can quickly out-distance a human on rocks over which they clamber with surprising ease towards their second home, the water. These forms may be referred to alternatively as "walking" seals, but their external ears are their most obvious distinguishing feature.

Members of the Phocidae lack external ear flaps: there is only a pair of small apertures in the skull behind the eyes. Seals of this group cannot bend their hind flippers at right angles to the body and progress on land by means of an ungainly hitching motion on their bellies, propelled by their rather small front flippers.

Earless seals swim by means of a sculling action of the hind flippers — and hence may be known as "swimming" or "true" seals — using their front flippers for braking and manoeuvring. The eared fur seals and sea lions use their large front flippers like paddles for swimming and steer by means of their hind flippers.

They also have denser fur and do not dive to such great depths as the more aquatically adapted earless seals.

The Australian sea lion numbers only about 4-5 000 individuals over its entire range from Houtman Abrolhos, W.A. to The Pages east of Kangaroo Island, S.A., making it one of the world's rarer species. The New Zealand fur seal population in Australia is about the same size, but this species is much more numerous across the Tasman Sea. It occurs in Australia over much the same range as the sea lion, but does not extend as far north along the Western Australian coast.

Survivors of the Dutch East Indiaman *Batavia* wrecked on Half Moon Reef in the Abrolhos are said to have killed and eaten 147 seals — most probably sea lions — during the six months they stayed in the archipelago awaiting rescue. Sea lion colonies around the Western Australian coast are small in number but breeding takes place and it seems unlikely that there is much if any intermixture between the sea lions of Western Australia and South Australia where much larger breeding colonies occur. There are probably only 750-1 000 sea lions in Western Australia altogether and 3-4 1000 in South Australia.

Houtman Abrolhos, North

▲ A New Zealand fur seal, *Arctocephalus forsteri,* on a granite outcrop off the south coast of Western Australia. (Photo I. Abbott).

▼ Australian sea lions on a beach at North Fisherman Island W.A. These animals are relatively abundant off Western Australia and South Australia and, in most cases, are unafraid of man. (Photo. J.K. Ling).

Fisherman Island, Carnac Island and the Recherche Archipelago are the main haunts of sea lions in Western Australia, whilst fur seals are most numerous on the islands of the Recherche Archipelago.

The main colonies in South Australia are on Nuyts Archipelago, Kangaroo Island, the Neptune Islands and the Sir Joseph Banks Group in Spencer Gulf, and The Pages. Fur seals are most common in the three first-named areas.

Fur seals breed during December and January each year on rocky islands and headlands; a single black-coated pup being produced and nursed for 6-8 months. They tend to be very timid and immediately take to the sea when disturbed. Hence it is very important that fur seal breeding sites are not visited during the pupping and nursing season in order to reduce any disruption of normal breeding behaviour.

Sea lions are enigmatic animals: very unafraid, almost friendly, on sandy beaches where they doze and pose for photographers. However, on rocks or boulder-strewn beaches where they breed, they too are rather wary or belligerent: tending to hold their ground rather than take flight. Nevertheless, it is important not to disturb breeding areas.

▲ Fur seals are particularly difficult to approach as they are wary and ready to plunge into the sea if disturbed. However, their breeding sites on rocky headlands and islands help to protect them from interference by making access difficult. (Photo I. Abbott.)

It has been found that sea lions at Kangaroo Island, S.A. have their pups at about 18-month intervals, but it appears on the basis of repeated observations by wildlife officers at various points around the coast that an annual breeding cycle is the rule elsewhere. Much more careful study, using marked or at least individually identifiable animals, is required to elucidate the reproductive behaviour of this rare species.

Fur seals and, to a lesser extent, sea lions were hunted for their pelts during the first few decades of the nineteenth century. Sealers worked the islands of the Recherche and many hundreds, if not thousands of skins went overseas. Seals do not appear to have regained their former numbers as judged by the size of some of the early cargoes, rather than reliable information about the colonies themselves. We cannot even be sure of the exact indentity of the fur seal species taken. However, Matthew Flinders certainly distinguished between fur seals and sea lions ("hair seals").

I would be extremely interested in any information about sea lions and fur seals in particular and seals in general from around the Western Australian coast. Data relating to breeding biology: date of birth, number of breeding females and pups, number of breeding males in attendance, mating, suckling and mortality would be immensely valuable. I should be happy to exchange information or provide more details to any interested person, for example, census methods, age categories, identification or photographs.

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An Excursion into Southern Western Australian Eucalypts

by Dr. Stephen Hopper, Research Officer, W.A. Wildlife Research Centre

The eucalypts of southern Western Australia are among the most valuable biological assets of our State. Their monetary worth is apparent in the many millions of dollars earnt annually and the thousands of jobs that arise from industries such as forestry, plant nurseries, beekeeping, wildflower harvesting, tourism, recreation and land reclamation. Equally important is the value of eucalypts in contributing to the richness and complexity of wild communities of plants and animals. Being dominant trees or mallees, the eucalypts play a conspicuous role in the landscapes seen every day by most Western Australians.

The number of eucalypts in the southern half of the State is not know precisely. Probably 150-200 occur in the region, and at least 70% are found nowhere else. Because there are so many species, and because some show only subtle differences in their nuts, buds, flowers, foliage, seeds or seedlings, the identification of our eucalypts appears a formidable task to the uninitiated botanist. Like many of my colleagues, until recently I was content to learn to recognise a few of the striking ornamental eucalypts and important local trees and leave the identification of the rest to the experts. However, constant encounters with eucalypts in the field impressed upon me the need to learn more about their identification and biology.

In this article I wish to recount some of the experiences gained on a field trip in company with Ian Brooker, a botanist from the Division of Forest Research, CSIRO, Canberra. Ian specialises in the classification and naming of eucalypts. His aim for the trip was to collect specimens of W.A. eucalypts belonging to the subgenus *Monocalyptus*, a group that includes many important timber trees such as jarrah *(E. marginata)* as well as a number of the rare mallees of the State. The collection was for a study of the evolution of the group that Ian was undertaking jointly with Dr Pauline Ladiges of Melbourne University and Dr Chris Humphries of the British Museum. As it turned out, he was able to obtain all the specimens required, plus some unexpected bonuses. At the same time, I was able to make a collection of correctly named specimens for future reference by workers at the Wildlife Research Centre, and learn a lot about eucalypts in the process.

◀ Statuesque karri Eucalyptus *diversicolor* lining valley slopes in the Warren National Park south-west of Pemberton. This important timber tree is the second tallest hardwood in the world. The karri forest occupies the highest rainfall region of south-western Australia, and harbours many plants and animals found nowhere else. (Photo S.D. Hopper)

Granite Rocks

The trip lasted from November 8-17, 1981, and followed a route of some 3 620km as shown on the map. Our first stop east of Perth was near the boundary of the wheatbelt north-east of Merredin at a stand of caesia *(E. caesia* subspecies *magna)*. This rare spectacular mallee is confined to the crevices and margins of large granite rocks in the central wheatbelt. It is widely grown in cultivation because of its large pink flowers, white branchlets, buds and fruits, and handsome red-brown bark. In winter large numbers of honeyeaters are attracted to its flowers. Ian and I had visited the rock on which it was growing two years previously. We collected some specimens of caesia and of a form of silver mallee *(E. crucis)* soon to be named subspecies *lanceolata*. Pressing eastwards, we made for Coolgardie that night.

Coral Gums

It took the whole of the next day to travel the 160 km between Coolgardie and Norseman. Largely for my benefit, we stopped whenever a new eucalypt was seen so that I could obtain a specimen and take photographs. The season had been a good one in the Goldfields and almost all of the 25 species we saw that day had lush new growth and an abundance of buds. One striking species in flower was the coral gum *Eucalyptus torquata*. We saw this small rough-barked tree in isolated stands at several location. Honeyeaters invariably were calling from these trees, and Yellow-throated Miners, Yellow-plumed Honeyeaters and Red Wattlebirds were seen taking nectar from the pink flowers.

An area of low woodland to the north-west of Norseman was the highlight of the day. Here a mixture of nine different eucalypts was located: (salmon gum *Eucalyptus salmonophloia*, Dundas blackbutt *E. dundasii*, Dundas mahogany *E. brockwayi*, merrit *E. flocktoniae*, red morrel *E. longicornis*, gooseberry mallee *E. calycogona*, snap-and-rattle *E. gracilis*, a form of goldfields blackbutt *E. lesouefii* with strongly-ribbed fruits and known for a long time as *E. pterocarpa* and an unnamed species related to capped mallee *E. pileata)*. Six of these were small trees with smooth white bark. At a glance the woodland appeared to be uniform but new species came to light with each specimen of buds and fruits that was collected. The richness of this tree community was reminiscent of that seen in the rainforests of Queensland. Yet we were standing in an arid zone woodland whose climate, in any country other than Australia, would render the vegetation desert.

Heading south from Norseman the next day we stopped at a smooth-barked tree 8 m tall that turned out to be narrow-leaved red mallee *E.*

▲ Flowers of ridge-fruited mallee *Eucalyptus angulosa* with buprestid beetles taking nectar. In addition to insects, flowers of this south coastal mallee attract honey possums and several species of honeyeaters. (Photo S.D. Hopper).

▼ A New Holland Honeyeater, its bill covered in pollen, pauses vigilantly after feeding on nectar of the rare granite rock mallee *Eucalyptus caesia*. South-western Australia has several unusual eucalypts like this one that are predominantly pollinated by birds.
(Photo S.D. Hopper)

▼ Flowers and foliage of a stunted form of jarrah *Eucalyptus marginata* growing in the Stirling Range National Park. Jarrah dominates most of south-western Australia's small area of forest. Despite its economic importance as a timber tree, aspects of the biology of jarrah such as its pollination are virtually unknown.
(Photo S.D. Hopper)

foecunda. I was familiar with this species as a common mallee of the wheatbelt. Its occurrence as a tree near Norseman is an enigma, although the infrequency of bushfires in this region is a possible explanation.

South of Salmon Gums at Truslove, we turned east towards some granite rocks in an area under consideration for the release of new farmland. Goblet mallee *E. merrickiae*, a species with erect narrow leaves and cherry-red buds, was observed on road verges not far east of the main road. Also encountered in the same area were *E. halophila*, a recently named mallee of salt lake margins, and an as yet unnamed species, probably in the series *Incrassatae* with stiff leaves, big fruits and buds, and a preference for winter-wet depressions in low relief.

The Ironbark

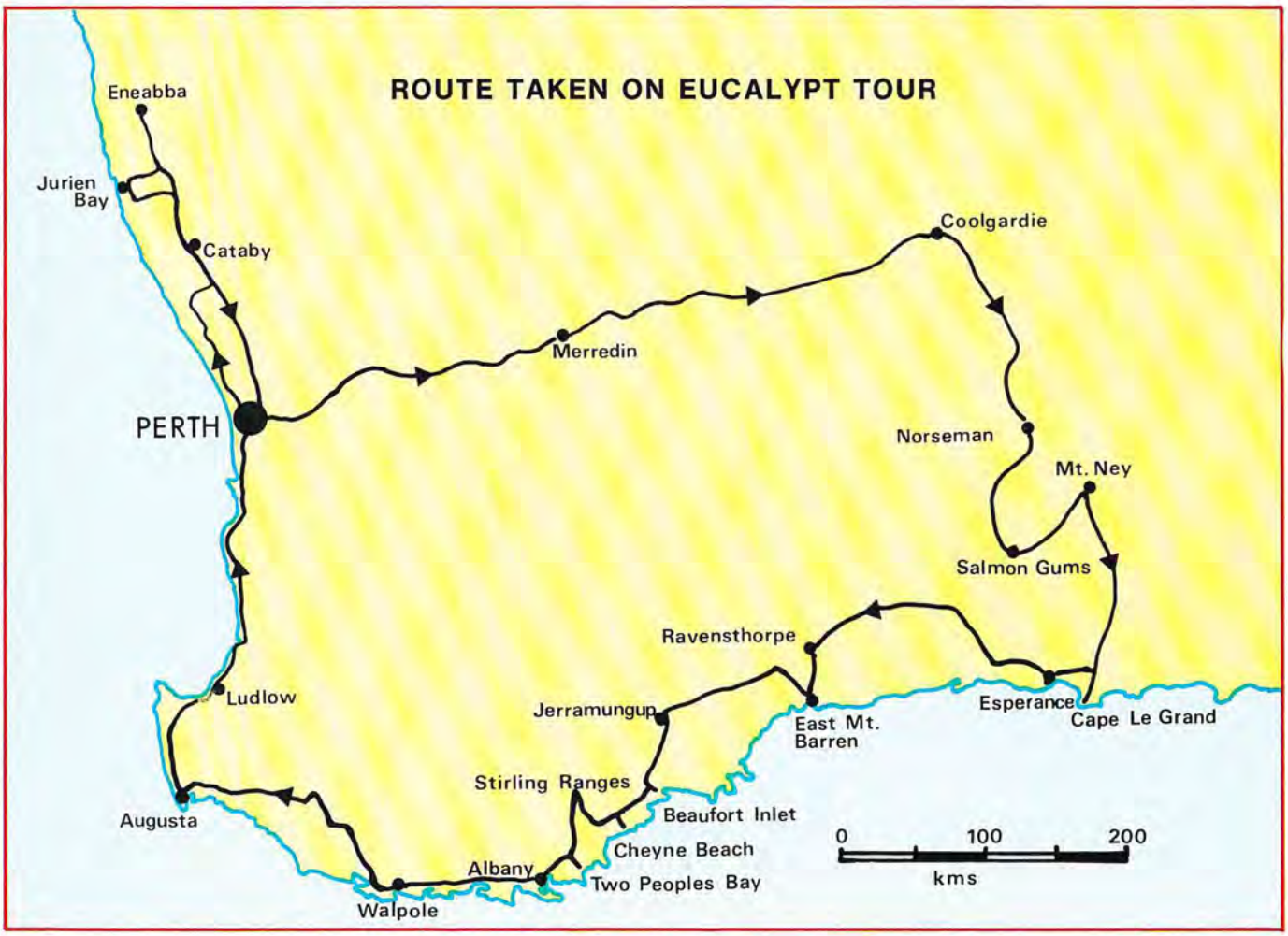
After camping overnight bedside an inland occurrence of bushy yate *E. lehmannii* on the granite slopes of Mt Burdett, we proceeded eastwards to Mt Ney. In transit we made the first of many new discoveries on the trip — an ironbarked tree mallee possibly related to redwood *E. transcontinentalis* but apparently unnamed. A few isolated clumps were found near Mt Ney and later we found large populations of it west of Grass Patch. Also in the Mt Ney area were some stands of cap-fruited mallee *E. dielsii*, an uncommon species near the eastern limits of its range.

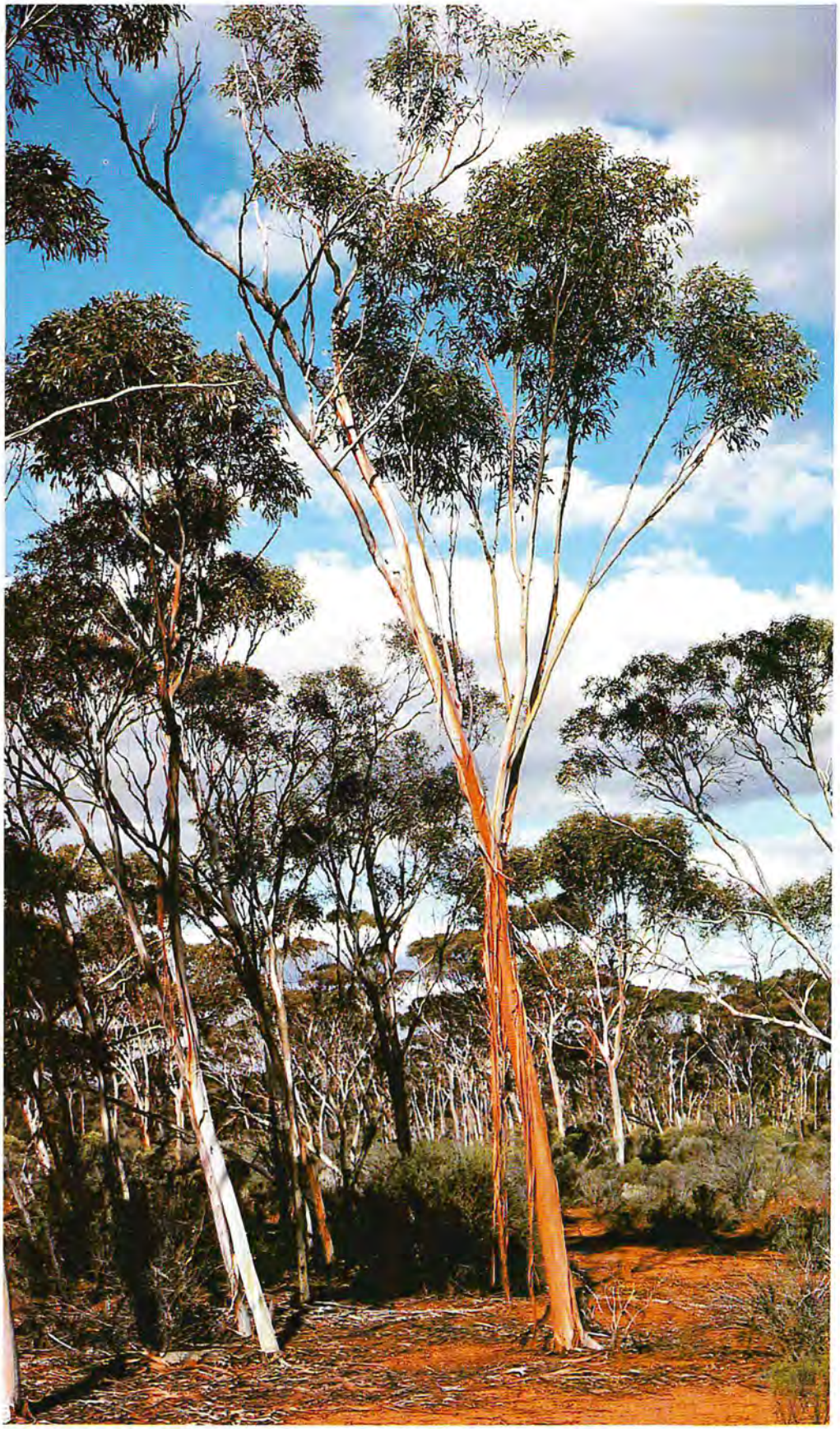
Cape Le Grand National Park was the next site on the itinerary. After seeing the ranger to inform him of our porposed work, samples of three rare species named by Ian were collected — Twin Peak Island mallee *E. insularis*, Mount Le Grand mallee *E. aquilina* and Lucky Bay mallee *E. ligulata*. These mallees were first brought to Ian's attention by Dr Arthur Weston who conducted a survey of the vegetation of the Park early in the 1970s.

In addition to these three, another eucalypt was collected during our brief visit that may prove to be new to science. The spectacular mountains, valleys and granite headlands of this National Park probably hold other rare eucalypts awaiting discovery by botanists prepared to walk its rugged terrain.

New eucalypts, new farms

We departed north-west from the howling winds of Esperance the next day and drove along the margins of current farms in a sweeping westerly arc to Ravensthorpe. This covered another region of mallee country proposed for release for new farms. The richness of the eucalypt flora encountered was remarkable. Up to ten species were found growing together at some locations (e.g. south-west of Grass Patch), the species seen in one hectare of seemingly uniform mallee were tall sand mallee *E. eremophila*, Jerdacuttup mallee *E. goniantha*, hookleaved mallee *E. uncinata*, Hopetoun mallee *E. leptocalyx*,





▲ An unnamed form of goldfields blackbutt *Eucalyptus lesouefii*, known by foresters as E. "pterocarpa". The seemingly uniform woodland in the background consists of nine distinct eucalypt species, six of which have smooth white bark. Such local species richness, and the presence of unnamed and undiscovered species, are features for which the south-west Australian Goldfields and Mallee region are famous. (Photo S.D. Hopper)

fuchsia gum *E. forrestiana* subspecies *forrestiana*, Port Lincoln mallee *E. conglobata*, merrit, black marlock *E. redunca*, goblet mallee and the unnamed ironbark mallee first seen near Mt Ney. Apart from the ironbark, other novelties seen in the region included a population of narrow-leaved mallee *E. angustissima* (a rare species not previously recorded from the area), unnamed tree forms of Port Lincoln mallee, tall sand mallee, black marlock and unnamed smooth-barked mallees related to flat-topped yate *E. occidentalis* and to redheart *E. decipiens*. At the end of the day I was left wondering if so much came to light among the eucalypts in just one day's travel through this region, how many other plant species as yet undiscovered would stay so forever if proposed land releases for agriculture go ahead at a faster rate than botanists can survey the flora?

Ravensthorpe Range

We spent the night in Ravensthorpe at the home of Andrew Chapman, a friend who was in the same zoology course as me at the University of Western Australia, and who had taken up life in the country after spending several years working with the W.A. Museum. An inspection of the rough-barked trees around Andrew's house the next morning showed that they were not york gums *E. loxophleba* as I had previously supposed, but actually a mixture of red morrel and a new species with small glandular buds and fruits named *E. myriadena* (= many glands) by Ian.

Andrew and John Bennett (headmaster of the Ravensthorpe school) accompanied us south-east as far as the Ravensthorpe Range to show us the recently named rare mallee *E. bennettiae*. The range is another area very rich in eucalypts. Within a few hundred metres along the track we traversed, 14 species were encountered — *E. bennettiae*, warted yate *E. megacornuta*, the unnamed smooth-stemmed mallee related to flat-topped yate, bushy yate *E. lehmannii*, Jerdacuttup mallee, black marlock, swamp mallet *E. spathulata* var. *grandiflora*, hookleaved mallee, capped mallee,

merrit, lerp mallee *E. incrassata*, tallerack *E. tetragona*, bell-fruited mallee *E. preissiana*, and Desmond's mallee *E. desmondensis*.

Next we proceeded into the Fitzgerald River National Park to see the remarkable whipstick weeping gum *E. sepulcralis*. Andrew directed us to a location where these slender-stemmed mallees emerged up to 10 m over an open low scrub of the spectacularly coloured *Hakea victoria*. It was one of the most unusual and photogenic vegetation formations I had seen in Western Australia. Proceeding further south to East Mount Barren, we were to see two more rare eucalypts and encounter another striking plant — the crimson flowered *Regelia velutina* in full bloom. The day ended abruptly at Jerramungup with the vehicle refusing to start while in the only garage for miles.

Newbey's mallee

Several species of note were found as we made our way south and west of Jerramungup the next day. The Beaufort Inlet area had *Eucalyptus newbeyi* in full bloom. This small 7m tree was named early in 1981 in honour of Ken Newbey, an outstanding field botanist and farmer from Ongerup. The clusters of large yellow flowers of *E. newbeyi* hung in dense masses from the low open canopy of the trees, and attracted a host of New Holland Honeyeaters and Red Wattlebirds. When taking nectar, the heads of the New Holland Honeyeaters were completely surrounded by the long erect stamens of the flowers so that pollen was deposited as far back as the neck of the birds. The inlet area also contained stands of unnamed trees related to flat-topped yate and black marlock; and a mallee species that Ian had never seen before.

A brief stop was made south-west of Wellstead to collect material from roadside mallees that probably were hybrids between the apple mallee *E. buprestium* and the Albany blackbutt *E. staeri*. We struck the coast again at Cheyne Beach to examine a stand of Woolbernup mallee *E. acies*. Its cream flowers with erect stamens were being visited by pairs of large copulating thynnid

▲ A Bald Island Marlock *Eucalyptus conferruminata* stands 1m tall on the coastal slopes of Mt. Gardner in Two Peoples Bay Nature Reserve. This widely cultivated species was only recently recognised as being distinct from its close relative the bushy yate *E. lehmanii*. (Photo S.D. Hopper)

▲ The spectacular buds of *Eucalyptus newbeyi*. Each one is 8cm long. This rare south coastal tree was named in 1980, and is not yet widely cultivated. Its flowers attract numerous honeyeaters who have to bury their heads to the neck in stamens to harvest nectar. (Photo S.D. Hopper)

◀ The distinctive juvenile foliage of merrit *Eucalyptus flocktoniae*. All eucalypts produce juvenile leaves that are different in form from those on the adult plant. Merrit produces adult foliage, buds and fruit that are often difficult to distinguish from those of its close relative redwood *E. transcontinentalis*. The juvenile leaves of these two species are quite different, and hence are valuable for identification by botanists in the field. (Photo S.D. Hopper)

▼ Western pygmy possum taking nectar from a flower of *Eucalyptus caesia* on Boyagin Rock Nature Reserve near Pingelly. Little is known about the importance of these mammals as pollinators of south-western eucalypts. (Photo S.D. Hopper)

wasps with yellow and black abdomens. In addition to the Woolbernup mallee, two undescribed mallees related to ridge-fruited mallee *E. angulosa* and to redheart were seen.

Although Two Peoples Bay was our destination for the night, we decided to go via the Stirling Range to see *Eucalyptus talyuberlup*, another recently described mallee. It was a fortunate decision because two unnamed mallees were located as well, and we found large populations of the rarest of the kangaroo paws, *Anigozanthos onycis*, in the national park. On the basis of our discoveries during just one hour in the park, I resolved to do some more work in the Stirling Range in the near future.

Mallee to karri

The next morning involved a three hour hike over the rugged terrain of Mount Gardner on Two Peoples Bay Nature Reserve. Graeme Folley, the resident reserves officer, led the way to stands of the robust form of Bald Island marlock now known as *Eucalyptus conferruminata* (previously this species was confused with bushy yate. With a cloudless sky and light wind, we had grand views of the islands and headlands to the west and the Porongurups and Stirling Range to the north.

The long journey from Albany to Augusta consumed the rest of the day. Some relief was provided by a detour through the Valley of the Giants east of Walpole. Here majestic karri *E. diversicolor*, red tingle *E. jacksonii*, yellow tingle *E. guilfoylei*, jarrah and Rate's tingle *E. brevistylis* towered above the road.

After a windy night in Augusta, the ranger at Cape Leeuwin assisted us in locating the rare vine *Kennedia macrophylla* which I wished to photograph, and the Boranup mallee *E. calcicola*. Another crystal clear day was with us, making the coastal scenery and karri forests near Augusta handsome to view indeed. Most of the morning was spent driving along tracks and firebreaks in the Leeuwin National Park in an attempt to locate the southernmost stand of Boranup mallee. Having achieved this, we made for Perth in the afternoon. The statuesque tuart forests *(E. gomphocephala)* at Ludlow were of interest on the way, as were trees of redheart near Naval Base that had much rougher dark grey bark than their counterparts on the south coast. Otherwise the coastal plain offered relatively few new eucalypts comparable to those seen in the previous few days.

Rare northern mallees

The last day involved a round trip to Eneabba and back. Two rare species of the Jurien Bay area were the main aim of this leg of the journey. Trees intermediate between river gums *E. camaldulensis* and flooded gums *E. rudis* were observed on flats and watercourses north-west of Gingin. A clump of the northern heathlands race of the Mottlecah *E. macrocarpa* was seen covered in large red flowers south of Cataby (see SWANS Vol. 11 No. 3).

Johnson's mallee *E. johnsoniana*, one of our target species, was found in flower and bud at several locations north-east of Jurien Bay. It was usually less than 1.5m tall but nonetheless conspicuous by a flush of new, yellowish growth as an emergent mallee from the dense low heath of the region. An unexpected find was that the tallerack in the area occurred in two forms, one with typical fruits and the other with fruits intermediate between the typical form and those of the related Gittins mallee *E. gittinsii*.

We spent a few hours on the farm of John and Judy Browne examining a population of the rare whipstick Badgingarra mallee *E. pendens*. Like its close relative the weeping gum, this species emerges from the low heath as a spindly thin-stemmed mallee up to 3m tall, instantly recognisable when silhouetted against the horizon. The Brownes have left areas of uncleared bush on their farm for the purposes of soil conservation and to preserve some of the rich flora that characterises the region in which they live. The value of such an enlightened approach to farm management for flora and fauna conservation cannot be overstated, particularly in country where the flora changes dramatically in composition over distances of less than a kilometre.

We completed this last day with an hour's work at the Wildlife Research Centre changing newspaper sheets on our drying specimens. In all, Ian had collected about 600 specimens, 200 packets of nuts and seed, and 50 jars of buds and flowers preserved in alcohol. It was un invaluable collection, containing the first material available of several new eucalypts. In our ten days we had seen 125 different species, about a quarter of the whole genus.

It will take several months for all the material collected to be investigated and understood. Each presumably new species needs to be compared with specimens in the herbarium, the seeds need microscopic examination, and seedlings need to be raised to be sure that something really new is at hand and to determine relationships with other eucalypts.

The trip instilled in me lasting impressions of this fascinating and economically important group of plants. It's clear that much remains to be discovered about southern Western Australian eucalypts. Moreover, pressure for the release of new land for agriculture places some urgency on botanical surveys of the genus in the regions concerned.

Willy Wagtail
(Rhipidura leucophrys)

(Photo copyright A.G. Wells)

One of Australia's most familiar birds, the little Willy Wagtail can be found almost anywhere in the country, except in dense forests or on open, treeless plains. They are common in inhabited areas, parklands and even cities, and their numbers have probably increased significantly as a result of man's clearing the bush for cultivation.

At rest, the Willy Wagtail sways its body and tail constantly from side to side, before flitting about restlessly in search of prey. It has been known to take insects and occasional worms, and also picks spiders off the outside of buildings.

Willy Wagtails are particularly aggressive when breeding. They have been seen to attack and drive away such large birds as Wedge-tailed Eagles, Brown Hawks, Laughing Kookaburras and Magpies. Both male and female birds help to build the nest which is generally made of fine grass and spiders, webs and placed on a horizontal branch close to the ground. However, nests may be placed in sheds or verandahs.

Several clutches of 3 to 4 eggs may be laid in one season and incubation takes about 13 days. The bird breeds between June and February.

The Willy Wagtail may be confused with the Restless Flycatcher with inhabits similar open country. However, the latter has no white eyebrow but has a white throat.

Common Birds of Perth Number 1

Australian Kestrel
(Falco cenchroides)

(Photo copyright A.G. Wells)

A bird of the open woodland and coastal dunes, the Australian Kestrel, or Nankeen Kestrel as it is sometimes called, is most easily recognised by its hovering ability. The bird is able to remain poised at a spot in mid-air for several minutes at a time before flying to another position to hover again in its search for prey on the ground.

When it sights its prey, the bird drops lower and lower before dropping rapidly the last few metres on to its victim. Insects are its main food item but the bird also eats small mammals, particularly house mice, and occasionally small birds and lizards.

The Australian Kestrel requires open grassy areas for hunting and although most common in open woodland and coastal dunes it is also often seen on cultivated land where house mice and insects abound. If not molested the birds become relatively tame and fearless of people in these places.

The bird breeds between August and November but does not build a nest, instead laying its clutch of from 3 to 7 eggs in tree hollows, crevices in cliffs, or even on ledges of city buildings. In *Birds of Western Australia* by D.L. Serventy and H.M. Whittell there is a report of a pair of kestrels nesting in a tower of the Perth Town Hall in Barrack Street in 1971.

Its eggs are rounded, white with brownish-red blotches, or are sometimes so heavily marked that there is little of the white colouring showing.

Common Birds of Perth Number 2

Gingilup Swamps — An Important Wetland Reserve in the South-West

by Clifford Young

Just to mention the word "swamp" to most people is often enough to conjure up visions in their minds reminiscent of scenes from an old Humphrey Bogart film classic, *The African Queen*. Complete with thigh deep black water oozing putrescent bubbles, the constant whine of mosquitoes overhead, blood-sucking leeches by the thousands and a myriad of other unspeakable creatures lurking in the undergrowth.

However, mention the word to ardent birdwatchers and other nature lovers and they will revel in recounting to you the absolute delights experienced during their last swamp trip. Oblivious to any discomforts they may have suffered, they will talk of a nature wonderland and the spectacle of birds feeding and nesting in an area of abundant food and relative peace, free from man's interference. In other words, those same conditions which act to keep man out of an area such as a swamp also act to make the area a good refuge for wildlife.

One such swamp in Western Australia's south-west is the Gingilup Swamps, a C-class Reserve vested in the Western Australian Wildlife Authority. The area was originally set aside for the conservation of flora and fauna in October, 1970.

The Gingilup Swamps lie on the headwaters of the Scott River which flows west for 30 kilometres and empties into Hardy Inlet opposite Molloy Island. For its length the river is protected by crown land reserves which are continuous from the Gingilup Swamps to the Scott National Park at the river's outlet. The protection afforded by these reserves is undoubtedly one reason why the Scott River remains a valuable source of high quality water all year round. This is in contrast to other waterways where such reservation of headwaters, river and foreshores is lacking.

In addition, the swamp's vegetation stabilises the headwaters of the Scott River. The vegetation is biologically rich and provides ideal wildlife habitat over summer as well as winter.

A recent field survey by one of the Department's Wildlife Officers, Peter Lambert, revealed some of the

◀ This frog, *Hyla adelaidensis*, was one of two species recorded on the reserve. This specimen was found near the southern boundary. (Photo P. Lambert)

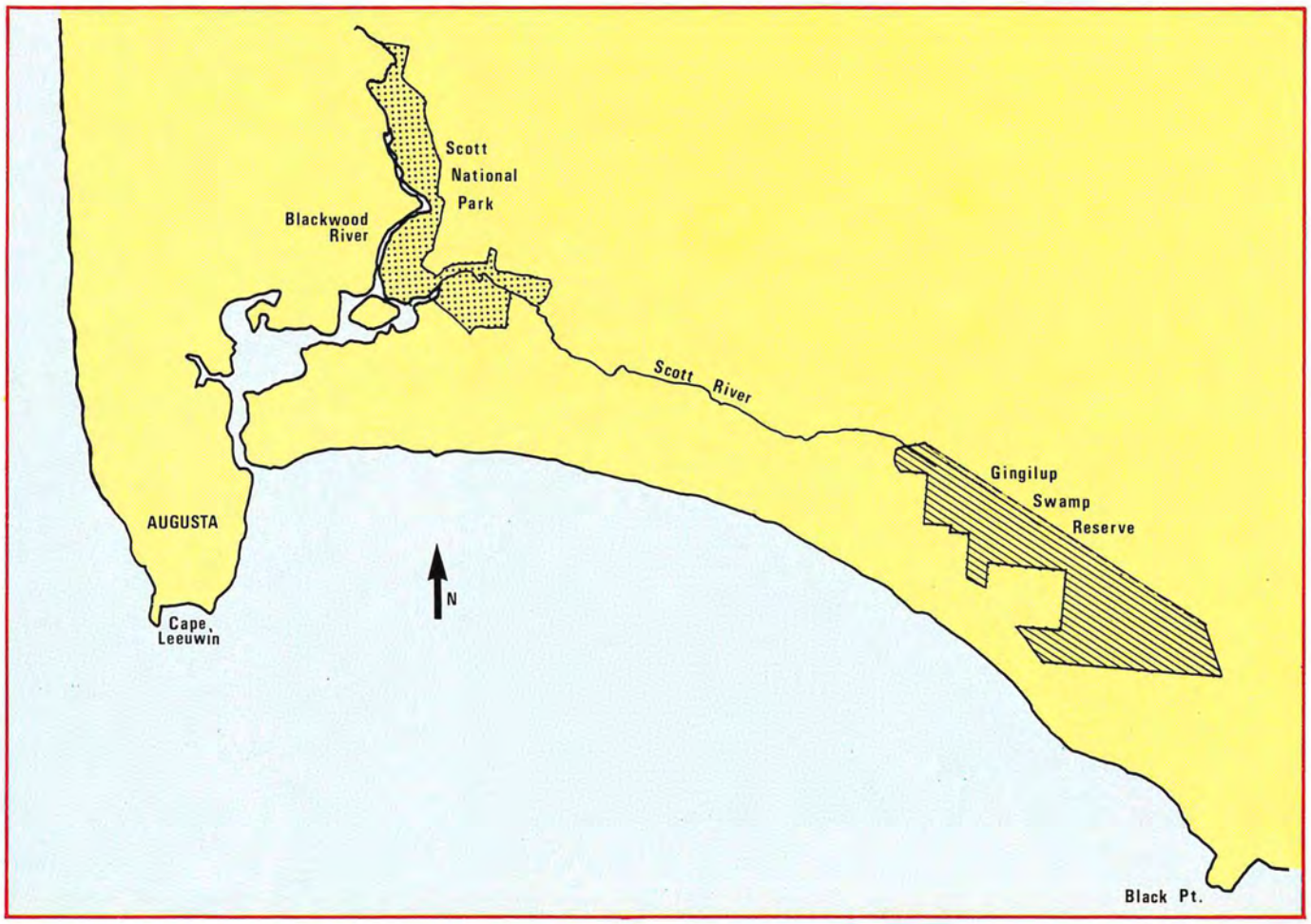
▼ Clamorous Reed-warbler. (Photo copyright A.G. Wells)

The Red Swamp Banksia or water bush, *Banksia occidentalis*, is common on the reserve in small dense thickets. It forms a haven for honeyeaters and other passerines of the area. (Photo P. Lambert)

This specimen was seen near the southern boundary. It is a Stout Blind Snake, *Typhlops pinguis*. (Photo P. Lambert)

A Golden Whistler, another commonly recorded bird of the reserve. (Photo copyright A.G. Wells)

The Yellow Jugflower, *Adenanthos detmoldii*, is a gazetted rare plant of the damp sandy flats in the Scott River area. It was recently reported to occur on the western side of the Gingilup Reserve. (Photo P. Lambert)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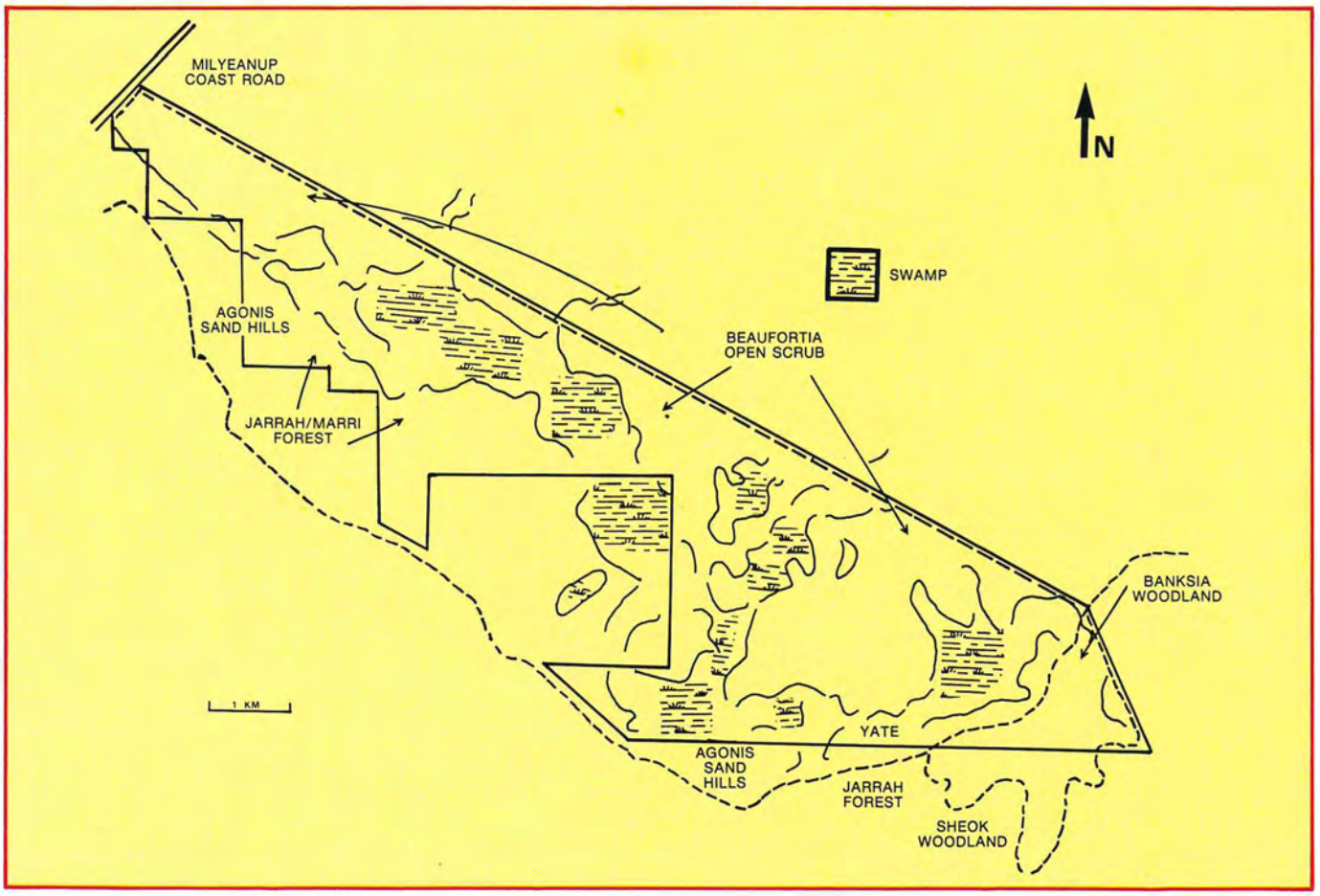
MILYEANUP
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SAND
HILLS
JARRAH
FOREST
SHEOK
WOODLAND

▲ A typical wet depression fringed on higher ground by *Banksia occidentalis, Oxylobium lanciolatum, Melaleuca* sp, and *Agonis juniperina.* (Photo P. Lambert)

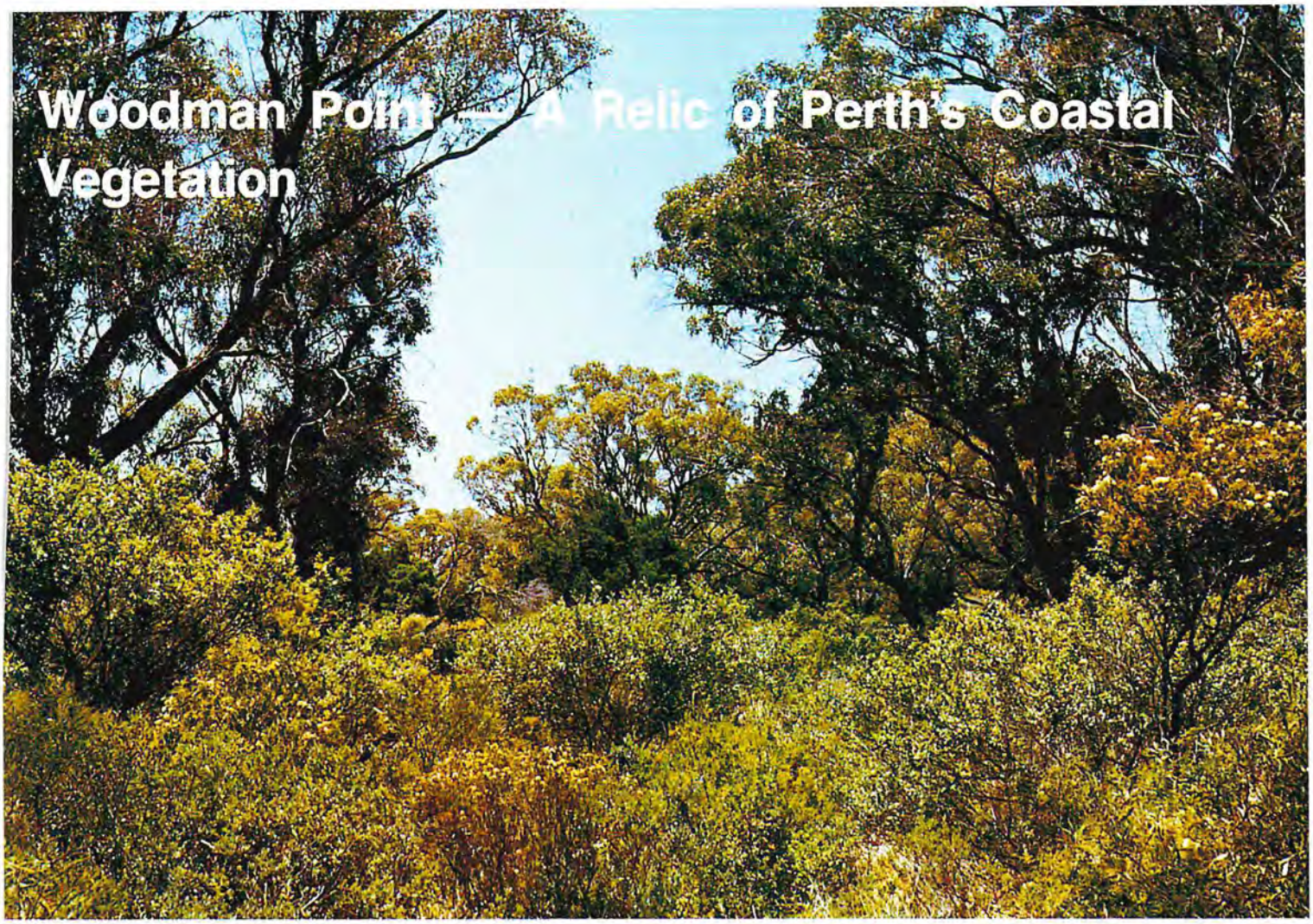
▼ *Hyla moorei,* another species of frog recorded on the reserve. (Photo P. Lambert)

suspected richness of the reserve's birdlife. Amongst the birds seen within the reserve were the Little Wattle-bird, Red-winged or Blue Breasted Fairy Wren, Grey Currawong, Golden Whistler, Australian Hobby, Ring-necked Parrot, Marsh Harrier, Grey Butcher-bird, Australian Kestrel, Elegant Parrot, Common Bronzewing, Richard's Pipit, Emu, Western Magpie, Stubble Quail, Willy Wagtail, Dusky Wood Swallow, Red-eared Firetail, Kookaburra, White-tailed Black Cockatoo, New Holland Honeyeater, White-backed Swallow, Purple-crowned Lorikeet, Restless Flycatcher, Grey Fantail, Crow, Scarlet Robin and Brown Falcon.

In addition to the birdlife observed within the reserve, other fauna seen included numerous grey kangaroos and several species of skinks, snakes and frogs. The officer also reported that the reserve's vegetation was of considerable interest and varied between low jarrah forest, sheok woodland, beaufortia scrub and banksia woodland. It was also reported that a relatively rare species of banksia had been found growing on the reserve. The species was subsequently indentified as a variety of *Banksia meisneri* which, although known to occur infrequently from the Scott River to Busselton, had previously only been collected from road verges. This was the first record of the plant occuring on an nature reserve and, as such, increases the importance of the Gingilup Swamps for conservation.

It is very probable that many other species of flora and fauna exist on the reserve without the Department's knowledge. This is largely due to the nature of the reserve, being extremely wet and impassable during winter and little better in summer. However, as pointed out earlier, this very fact has helped preserve the swamps in their natural state.

Woodman Point — A Relic of Perth's Coastal Vegetation



▲ Tuart woodland, with typically spreading trees and a dense woody understorey. In flower at the right is the honey-myrtle *Melaleuca acerosa*. (Photo R. Powell)

Although many people visit the southern shore of Woodman Point, the rest of this small peninsula (9 km south of Fremantle Harbour) is not well known, because it has been fenced since the beginning of this century in two enclosures — a Quarantine Station and a Reserve for Explosives.

The Point is thought to have formed during the last few thousand years, by the accummulation of beach sand on an underwater limestone shelf. The soil is entirely of the type known as Quindalup — the white sand bordering the sea in a belt of varying breadth from Geographe Bay to Dongara.

Considerable portions of the enclosures were left uncleared, and four plant communities may be easily distinguished: a seaside community; a cypress belt; tuart woodland and forest; and heath and scrub. The seaside community, along the shores of the peninsula, consists mostly of ground-covers and low shrubs that can tolerate the poorness of the soil and the heavy salt content of the air close to the sea. The lessening of such maritime influences is reflected in a sharp zonation of the more and less tolerant species.

Inland of the seaside community lies a belt consisting typically of low closed forest of Rottnest cypress *(Callitris preissii)* with a few chenille honey-myrtles *(Melaleuca huegelii)*, the canopy being so dense that little understorey can grow. The stands are interrupted, however, by occasional patches of *Acacia rostellifera* over a thicker, richer understorey.

Tuart *(Eucalyptus gomphocephala)* forms a woodland over much of the inner part of the peninsula; where the land is especially low-lying the trees stand closer together, in a small forest. The tuart is absent, on the other hand, from some of the ridges, sites with slightly drier soil and greater exposure to salt-bearing winds; here the vegetation is heath and scrub. The tuart and heath/scrub communities are floristically the

▼ Pink fairy orchid *(Caladenia latifolia)*, abundant in the tuart community. (Photo R. Powell)

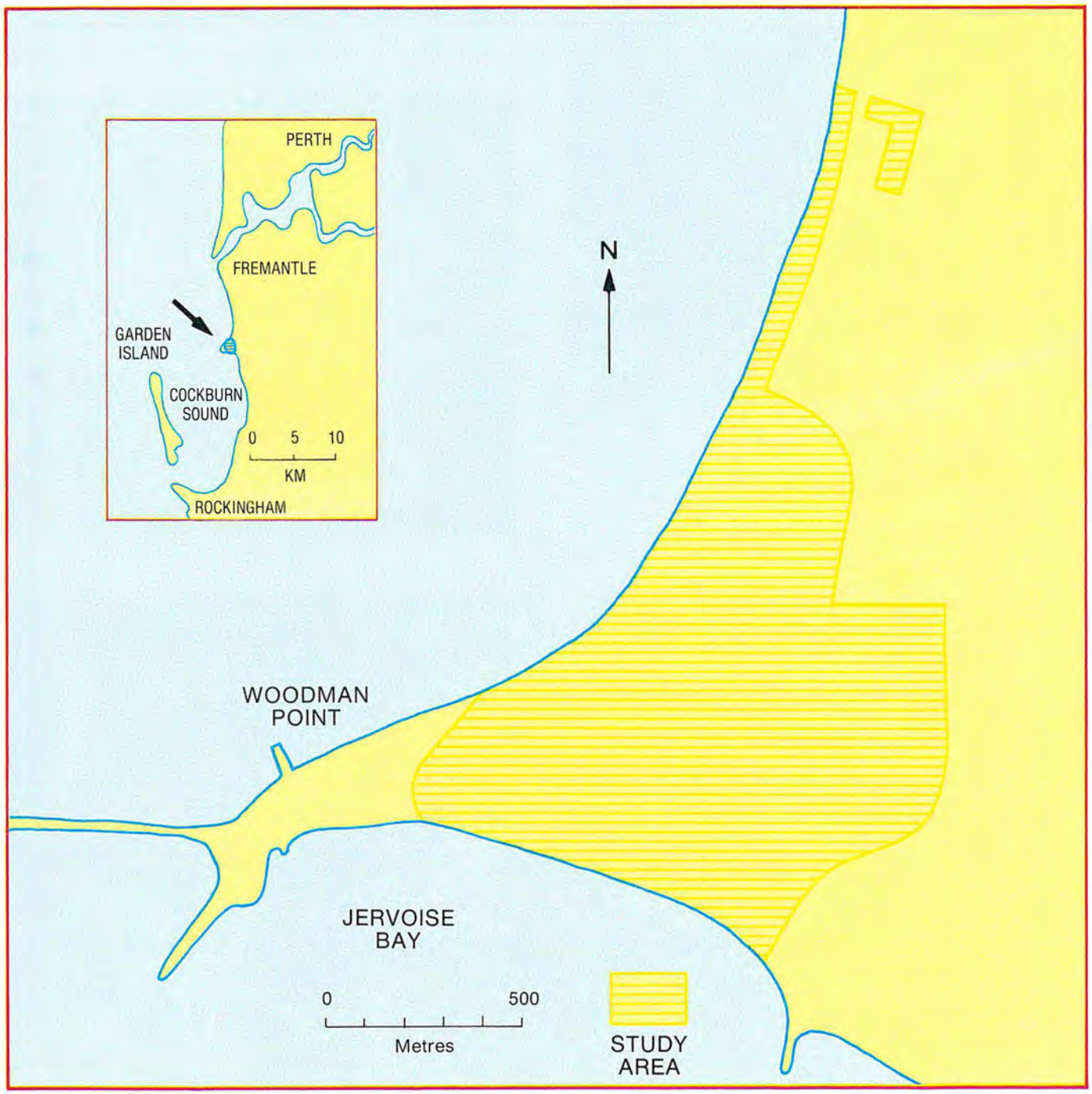
▲ Tangles of the creeper *Cosmesperma integerrimum on Acacia rostellifera* trees. These wattles grew up after this section of the enclosure was last burnt, about 1949, and are now fully developed. The oldest of the creeper stems probably also date from that time. The understorey here is dominated by the native spear-grasses *Stipa elegantissima* and *S. varuabilis.* (Photo R. Powell)

richest, and have many species in common, but in different proportions. For example *Diplolaena dampieri* and the honey-myrtle *Melaleuca acerosa* dominate the heath but are among the less common components of the understorey in the tuart community.

The exclusion of the general public has largely protected the enclosed vegetation from trampling and dumped rubbish. A further, and probably the most important, consequence has been the rarity of fires. The effects of two fires (in 1949 and 1973) are still evident in two sections of the enclosures, but other parts have probably not been burnt this century and perhaps for much longer.

As a result the vegetation differs in many respects from other coastal vegetation in the Metropolitan Region, even though the species represented are largely the same. The tuart trees, for instance, are generally in much better health than tuarts elsewhere in the Metropolitan Region, especially those near the ocean, many of which have been deteriorating for years under the combination of stresses brought to bear by an altered environment. Many shrubs and creepers develop to much greater sizes (and ages) at Woodman Point than elsewhere; examples are the wattles *Acacia cochlearis* and *A. rostellifera* (which indeed grows into a tree), the honey-myrtles *Melaleuca acerosa* and *M. huegelii*, the heath *Leucopogon parviflorus*, quandong *(Santalum acuminatum)* and cockies' tongues *(Templetonia retusa)*, and the creepers *Comesperma integerrimum*, *Hardenbergia comptoniana* and old man's beard *(Clematis microphylla)*.

The proportions of various species



▲ *Diplolaena dampieri* — abundant at Woodman Point but uncommon elsewhere in the Metropolitan Region. (Photo R. Powell)

▲ Belt of Rottnest cypress *(Callitris preissii).* (Photo R. Powell)

Coast goundsel *(Sencio lautus)* — a species of the seaside community. (Photo R. Powell) ▶

▼ Leaves and fruits of quandong *(Santalum acuminatum).* (Photo R. Powell)

▲ Multi-stemmed tuart. Whilst tuart trees normally grow with a single trunk, multi-stemmed specimens are not uncommon on coastal sites such as Woodman Point; this habit allows them to develop a lower, broader canopy, which is less vulnerable to salt winds. (Photo R. Powell)

◀ Yellow tail-flower *(Anthocercis littorea)*, a short-lived colonizer of disturbed sites, uncommon at Woodman Point. (Photo R. Powell)

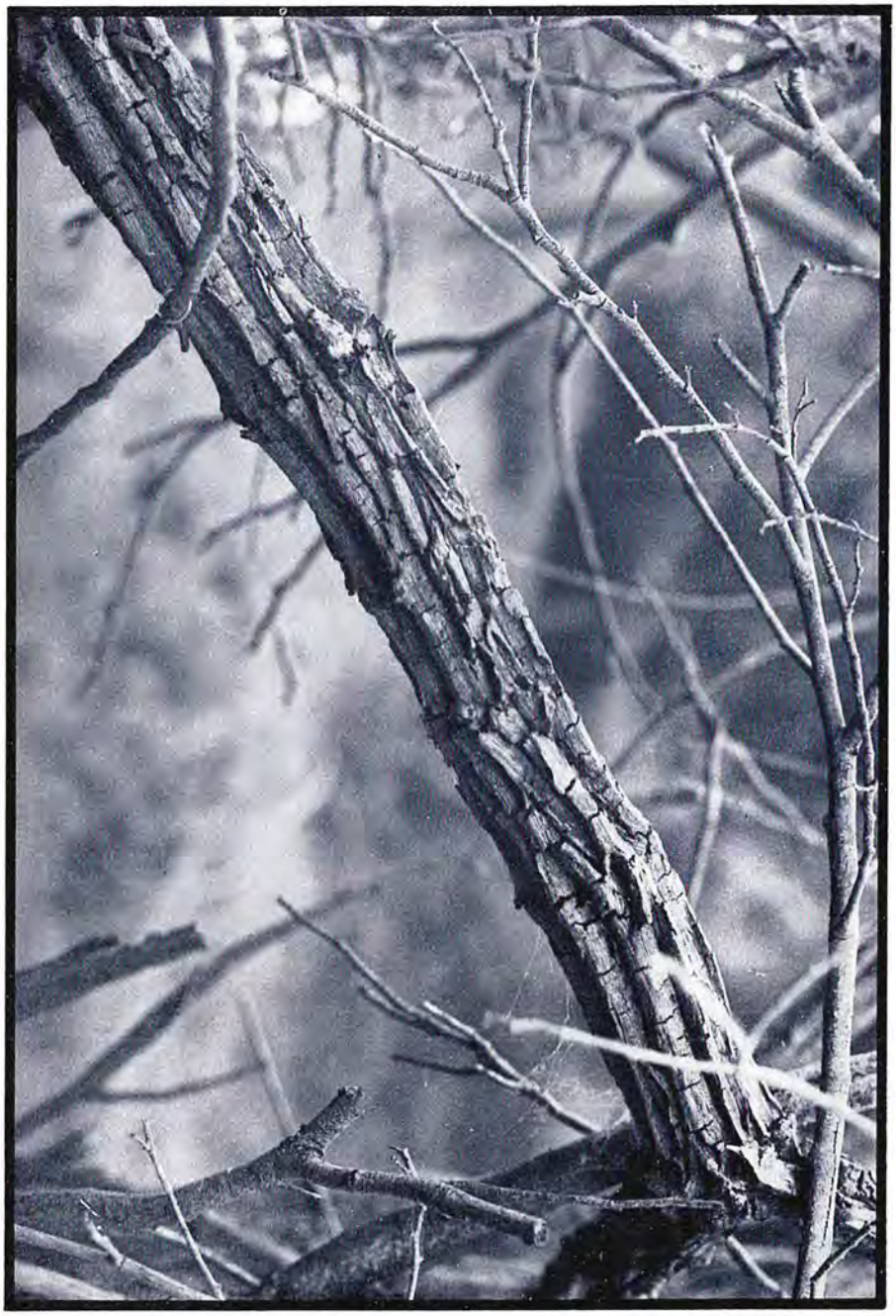
▼ View across heath, with tuart woodland behind. In flower is dune moses *(Acacia lasiocarpa)*. (Photo R. Powell)

in the vegetation also differs, those that die when burnt (such as the shrubs *Spyridium globulosum, Diplolaena dampieri* and *Leucopogon oxycedrus)* being much more abundant at Woodman Point than elsewhere. Particularly striking are the dense stands of Rottnest cypress *(Callitris preissii);* a similar belt may once have extended right along the coastal strip, but these trees are readily killed by fire, and elsewhere only scattered specimens survive. On the other hand, native species that colonize ground that has been disturbed (by fire or other means), such as *Olearia axillaris, Acacia saligna* and *Anthocercis littorea,* are much less common at Woodman Point than elsewhere. The same is even truer in the case of introduced species, particularly grasses, which are profiting enormously from disturbance along much of Perth's coastal strip, and are themselves helping to increase the incidence of fires.

Natural coastal vegetation reflects a sharp environmental gradient — the rapid lessening of the influence of the sea with increasing distance from it. Woodman Point is a good example, with its succession of distinctive plant communities, and it probably represents fairly closely the natural state of Perth's coastal vegetation. Elsewhere other influences (such as fire and trampling) have intervened; one community (the cypress belt) has been virtually eliminated, and the others much altered in composition and appearance.

Perth people make great use of their coast. There are therefore both aesthetic reasons and practical reasons (the prevention of erosion for instance) for trying to maintain its natural vegetation. Woodman Point is not only the best coastal study site for local students of biology and plant ecology: it could also provide a model for restoration programs along other sections of the Metropolitan coastal strip.

The future of Woodman Point has been much debated in recent years. The Quarantine Station and other Commonwealth land has now been bought by the State and is being managed by the Department for Youth, Sport and Recreation. The Explosives Reserve will be vacated as soon as money is available for the transfer of its functions to another site. The peninsula is then likely to be developed for recreation and conservation. Present plans include a "botanical reserve" in part of the area; this could be of great value if it is large enough and representative of the full range of natural vegetation currently found on the peninsula. In addition it would have to be very carefully managed so that the intrusion of the public should not bring in those destructive influences from which the vegetation of Woodman Point has been protected for so long.



▲ This thick stem of old man's beard *(Clematis microphylla)* — shown at half life-size — has taken many years to develop. (Photo R. Powell)

Summarised by Robert Powell and Jane Emberson from their recent book *Woodman Point: A Relic of Perth's Coastal Vegetation* (published by Artlook, Perth, W.A.)

New Minister for Fisheries & Wildlife Appointed

The recently appointed Minister for Primary Industry, Agriculture, and Fisheries and Wildlife Mr. Richard Charles Old, M.L.A. was born in Katanning in the Great Southern agricultural region of Western Australia in 1922.

In 1960, he entered local government when elected a member of the Katanning Road Board, later known as the Katanning Shire Council. In 1966, he was selected President of the Council, serving in this post until 1973. Also, he was a member of the Albany Zone Development Committee for ten years.

During his thirteen years as a Councillor, he actively sought and promoted development of the region, in line with the policy of decentralisation of which he is a leading advocate.

In July 1973, he was endorsed by

▲The Honourable Richard Charles Old, M.L.A. Minister for Primary Industry, Agriculture, and Fisheries and Wildlife.

the Western Australian Country Party for the Legislative Assembly seat of Katanning. He contested the 1974 State Election, winning the seat by an absolute majority. In April 1974, he was elected Chairman of the State Parliamentary Country Party.

In May 1975, he was elected the Party's Parliamentary Leader. In June 1975, he was appointed to Cabinet and became Minister for Agriculture.

With the advent of the O'Connor Ministry in January 1982, Mr. Old became Minister for Primary Industry, Agriculture, and Fisheries and Wildlife.

His achievements as a Minister have included sponsoring legislation providing for a combined coarse grains statutory marketing authority, overseeing a substantial restructuring of the dairy industry to give that industry a more stable and secure long-term foundation, implementing an extensive drought loans scheme and establishing farm water supply loan arrangements.

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WILDLIFE DISTRICTS IN WESTERN AUSTRALIA