Australians abroad find nostalgic reminders of home in the khaki green of a eucalypt forest in such exotic locations as India, Brazil, East Africa, California and Spain, while in W.A., descendants of northern Europeans picnic beneath stands of pine, relating fairy tales of wolves and cruel stepmothers to their Australian born children.

Although soothing to the migratory psyche, this change in the original order is obviously not simply to ward off pangs of homesickness. Rather, it is to ensure a balanced supply of valuable softwoods and hardwoods in domestic and world markets. Don Spriggins gives the full story.

Jim Lochman

Pines for form...

PINES - the

In W.A. all the native commercial timber comes from eucalypts, which are hardwoods. Introduced pine provides an alternative, softwood timber. Karri and jarrah timbers have often been used for purposes to which softwoods would have been equally or better suited. To counter this the recently released timber strategy encourages the use of hardwoods such as jarrah in visible, high value products such as furniture and panelling for home and overseas markets.

Sturdy timbers such as jarrah and karri have traditionally been used for all our wood needs. One difficulty in continuing this approach - which is not desirable - is whilst there are millions of trees in the karri and jarrah forests resulting from past regeneration of cut over areas, the trees are generally below current milling size. They need time to grow. The great attraction of pine is its ability to produce sawlog sized trees in 30-40 years compared with the 100 years it takes jarrah or karri to reach that size.

There is also great potential to generate valuable export income through pine. The timber import bill for Australia is about $1.7 billion per year (W.A.'s share is about $27 million) so it makes good economic sense to grow most of our needs, provided the cost of producing is competitive. As the world supply of quality hardwoods is decreasing, it also makes economic sense to use pine to replace hardwoods in house framing, beams and general building construction where, whatever timber is used, it is frequently covered with wall cladding. Once treated with chemical preservatives, pine also makes excellent electricity poles and railway sleepers, which will guarantee continued demand.

Courtesy Wesfi

function...

Richard Moore

and farming

soft option

Why not simply import pine from the Eastern States and New Zealand? Currently this would be possible, but W.A. grown pine will become more competitive with imports in the future. This is due to a combination of the lower value of the Australian dollar and the planned construction of highly efficient pine sawmills which will use larger logs, making locally grown pine timber cheaper to produce.

Pine forests become productive early in their career. They are initially planted with over 1 000 seedlings per hectare which ensures that trees grow straight and tall and there are enough to give a good selection in the final crop of about 150 trees. By age 12 a first thinning is required to remove some of the trees to allow the remaining trees room to grow on to produce sawlogs.

Material from the first thinning is suitable for making particleboard, paper or fencing. The amount of first thinning carried out is restricted to available markets and, up until the construction of a particleboard plant at Dardanup by Wesfi in 1976, little commercial first thinning occurred in the South-west. Stands stagnated and drought death of trees was common. Ten years of production of particleboard at Dardanup has now allowed most State plantations to be thinned, but there are some private forests which need attention. CALM recently proposed a system of providing a contract service to harvest and sell logs from private pine forests if the owner so wishes. About 100 000 cubic metres of sawlogs and 200 000 cubic metres of small particleboard logs are produced each year from Departmental pine forests. Cultivation of pine forests further

benefits the economy as sawmills and processing centres employ about 400 people full time. In the forests, another 100 people are involved in harvesting and haulage operations. Direct return to the State from the sale of pine timber is $9.8 million per year.

Pine forests generate employment. Recently, three new pine milling contracts were awarded, which will result in construction over the next few years of three major pine sawmills costing over $40 million. These will be at Mundijong and two other locations in the South-west. As well as creating employment during the construction phase, the new mills and associated logging are expected to provide 500 jobs when they are operational. These three new mills will generate a return to the community by way of royalties of about $100 million over a ten year period. The current major pine mill at Bunbury operated by Westralian Forest Industries currently employs 80 people, but this will rise as intake progressively increases.

By early next century, as the existing forests mature, it is expected that pine sawlog availability will have risen from 100 000 to 400 000 cubic metres per year. The plan is to continue planting 2 000 ha per year of *Pinus radiata* until the early part of the twenty-first century. Planting targets will be 1 000 ha near Albany with 500 ha in both the Central and Southern Forest Regions.

If this can be completed, approximately 100 000 ha of pine forest will have been established. This will have the capacity to provide 0.8 million cubic metres of sawn timber per year in perpetuity, which is very close to the current demand for sawn timber in W.A. All this from a forest which would only constitute 3.75% of the total area of the South-west!

Cliff Winfield

Pines create employment.

Courtesy Westfi

Pine is a beautiful as well as practical timber.

Hardwoods and Softwoods - What's in a Name?

Trees can be classified as either Gymnosperms or Angiosperms.

Gymnosperms, the more ancient in evolutionary development, produce uncovered seeds, usually in cone-like structures, hence a major portion of the trees classified as gymnosperms are called conifers. Gymnosperms are described as softwoods by botanists. This term has no relation to the softness of the wood, and confusion often results because carpenters and timber merchants frequently use the term to describe timbers which are easy to work with, but which are not necessarily softwoods in the botanical sense.

Angiosperms are flowering plants whose seeds are formed inside a ripening fruit. They are subdivided into monocotyledons, which include the palms and bamboos, and dicotyledons, to which the term hardwood is applied.

Cliff Winfield

Where it all begins: the pine nursery at Nannup.

A scheme called Softwood Share Farming was introduced in 1986. This system allows farmers to grow pines in partnership with CALM. Participants are paid an annuity and a proportion of the final crop return. They are also encouraged to undertake paid development work in the plantation, such as pruning and firebreak construction.

Response to the scheme has been encouraging. Since 1987, 2 500 ha has been established under the scheme, and it is hoped from now on up to 80% of the annual target of 2 000 ha per year can be achieved by sharefarming.

Pine stands in agroforestry are very open compared to traditional forest stands and agricultural activities such as cattle grazing takes place beneath the trees. An excellent example of this can be seen on the South West Highway, at Balingup, where cattle commonly graze under the pine canopy.

But the grazing cattle don't necessarily have the pines to themselves. Some West Australians have already discovered the joys of picnicking on a soft bed of pine needles, or have used the forests for orienteering, horse riding and car rallies. Each year thousands of West Australians sample the northern European flavour of the mature forests at Nanga Mill and Baden Powell Water Spout in the Lane Poole Reserve or go bushwalking and picnicking in the Gnangara pine forest north of Perth. Just as the Australian abroad souvenirs gumnuts to tuck nostalgically in a back pack, we may forage the forest floor for edible toadstools and fungi to grace our dinner tables!

Pine Variety

Over 80% of the world's timber supplies come from softwood trees such as pine, oregon or spruce; few native softwood species grow in Australia. In W.A. the only native softwood capable of yielding commercial timber is the callitris or cypress pine which grows in the Kimberleys, the Murchison, the Goldfields and on Rottnest Island. Although yielding fine timber, it is a very slow growing tree and uneconomical on a commercial basis. Consequently, pine forests in W.A. have been based on two species originating from the Northern Hemisphere, *Pinus radiata* and *Pinus pinaster*.

The native home of *Pinus radiata* (Monterey pine) is restricted to three small isolated forests on the Californian coast and a grove of trees on Guadalupe Island off the coast of Mexico, where it is an unimportant tree. But just as eucalypts have often performed better overseas than in their homeland, *Pinus radiata* has displayed remarkable growth rates when transplanted to New Zealand, Chile and Australia. In recognition of this, its botanical name for many years was *Pinus insignis* meaning the 'remarkable pine'.

In the Eastern States, *Pinus radiata* grows well on a range of sites, but in W.A. it requires an annual rainfall of about 700 mm a year, and deep, reasonably fertile soils or regular fertiliser dressing.

Marie Lochman

The pine plantation at Gnangara.

The second pine, *Pinus pinaster* (maritime pine) is outstanding in its ability to grow well on the lower rainfall and poor sandy soils of the Swan Coastal Plain. It occurs naturally over a wide area of Southern Europe. Of the several varieties known, the most successful in W.A. comes from the forest of Leiria in Portugal. The forest of Leiria, created by King Denis who reigned from 1279 to 1325 A.D., has been part of the royal estate and subject to regulation and management since its creation. During its lifetime much of it has passed through several growth cycles from seedling through to large size trees.

LANDSCOPE

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EDITORIAL

In W.A. the concept of marine conservation reserves was firmly established in 1984 when the CALM Act was passed, with provision for Marine Parks and Marine Nature Reserves, vested in the National Parks and Nature Conservation Authority.

Since 1984 two major Marine Parks have been declared in W.A: Marmion and Ningaloo.

This is a new field in W.A., and there are no local precedents to guide us in resolving the many management issues which have emerged.

A first consideration has been that fishing is already controlled under the Fisheries Act. It would be foolish for CALM to attempt to establish itself as a fisheries management agency. A policy decision has been made that any fisheries in Marine Parks will be regulated under the Fisheries Act.

A more philosophical problem has been that many citizens, although generally sympathetic to the conservation cause, are unaccustomed to the idea of having parks and reserves in the sea. The idea that the sea is a public common where anything and everything goes is still well entrenched in public attitudes. Yet there are many terrible examples around the world where coastal environments and their resources have been devastated by excessive and improper use. In W.A. we have not reached that point.

W.A. can be proud of its fisheries management record, based on the principle of sustainable use for posterity. Development of a marine parks and reserves system along our coast is another essential part of the overall objective. It is to be hoped, then, that our first initiatives in this direction will receive public support.

PINES

How can less than four per cent of the State's area supply us with all our timber needs, and save the hardwood forests at the same time? *Details on* ***page 28.***

BORERS

Now you ***can*** *be sure there are no borers in the door. Well, if they are there, at least you'll know what to call them after reading the article on* ***page 42.***

TROUBLED WATERS

Does the very word pollution make you feel powerless? Discover what you can do to help the wildlife victims on ***page 20.***

WALL OF MOUTHS

It's a fish-eat-coral world, but what do the coral eat? Find out on ***page 32.***

FOREST RENEWAL

What is the connection between the poets' of the First World War and W.A's forests? Find out on ***page 56.***

Jewel Of The Kimberley

What do you mean frog? In my home I am a prince. After all, Prince Regent is the only mainland reserve where all of the original animal species remain. Meet the rest of them on ***page 47.***

Hills' Belles

When Perth looks out its backdoor in spring the Hills are ablaze with colour. Your field guide to some of our glorious wildflowers starts on ***page 4.***

Gather No Moss

The trouble with lichen is that up until recently it wasn't protected flora. Now lichen and their relatives - mosses, liverworts and algae - have joined the rest of the State's flora. See ***page 54.***

Right On Track

Is a high-tech wilderness trek a contradiction in terms? Find out how 4WDs and conservation can co-exist peacefully on ***page 12.***

ATTENTION ADULTS!

Sick of taking the anklebiters to the same old national parks and camping spots? Put them to work for you. If they enter the kids' competition on ***page 63*** they could win two beautiful books on all the best picnic and camping spots between Perth and Eucla.

Cover Photo

Magpie Geese take off from the Ord River.

Photo: Richard Woldendorp.

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