KARRI FOR KEEPS

THE karri forest provides a classic dilemma for managers: it is an area of great beauty and biological interest, but it also has high economic value. An industry which has used timber from the forest for more than a century still thrives today. Is it possible to conserve such a forest? In this second article in a series, ***Barney White*** *and* ***Roger Underwood*** *examine:*

Roger Underwood

Farms and karri forest intermingle at Treen Brook (above).

Regrowth karri forest near Pemberton (opposite page). This area was clearfelled and regenerated nearly 60 years ago.

MANAGEMENT FOR MULTIPLE USE IN THE KARRI FOREST

In world terms, the history of the interaction between humans and forests has too often been a sorry one. Over thousands of years, forests have been cleared for farmlands or urban development, or they have deteriorated as a result of uncontrolled grazing, bush fires or timber felling without subsequent regeneration.

In recent decades, these problems have intensified. The world's population has exploded and so has the consequent demand for food, fibre, fuel and shelter. Such demands, if uncontrolled, can spell disaster for forests.

But this gloomy picture is not universal. The forest conservation situation in W.A. is far more optimistic. For example, after 150 years of agricultural and urban development in the south-west, more than 80 per cent of the original karri forest still remains and is firmly secured in public ownership. A clear vision for the conservation of this forest has emerged and a sound management policy is in place.

THE KARRI FOREST DEBATE

Controversy has surrounded W.A.'s karri forests since the early 1920s. First, foresters argued with farmers whether to keep the karri forest or clear it for dairy farms and orchards. This 30-year battle was not resolved until the 1950s when remaining Crown land karri forests were designated as State forest.

In the 1970s, controversy focused on forest conservation reserves: how much of the karri forest, and which areas, should be set aside in parks and reserves? This issue, too, has now largely been resolved. About one-third of the karri forest has been, or is about to be, set aside in national parks or other secure conservation reserves. No timber will be cut in these areas. Another 15 per cent of the forest makes up special zones surrounding important ecological, historical or recreational areas, or along roads and rivers. The priority for management of these areas is also conservation and amenity.

The current debate centres mainly on forest areas outside the reserves - or those forests designated for multiple-use management. These karri forests are also being managed for conservation of flora and fauna, but they must also provide long-term sustained yields of timber, recreation and fresh water supplies.

How should the multiple-use forests be managed and protected to ensure that their many values can be sustained? Here is the story of the approach adopted in the karri forest.

Cliff Winfield

Jiri Lochman

SUSTAINING THE FLORA AND FAUNA

The native flora and fauna is the most important 'product' which must be sustained in a multiple-use native forest. These forests play two important roles in flora and fauna conservation: they adjoin and often surround parks and reserves and buffer them from outside influences; and they are themselves home to a multitude of species of native plants and animals.

The flora and fauna of the karri forest is well known. Nineteen scientific surveys have been carried out in southern forests over the last 15 years. Research has also been conducted into the effect of various activities (such as timber cutting and regeneration) on the plants and animals of the forest. The results of these studies are encouraging: over the past century, during which time a large timber industry and expanding tourism has flourished in the forest, not one species of plant or animal appears to have been lost as a result.

Animals disturbed by logging have been found to repopulate the new regrowth forests, while plants on the forest floor are largely unaffected by the age of the trees above them.

Jiri Lochman

Jiri Lochman

A brilliant blue Fairy Wren goes in search of food (top) while a Looper Moth takes a close look at a Pimelea sylvestris *(centre).*

Looking like a giant rat, this Southern Brown Bandicoot is at home on the forest floor (above).

Timber cutting and regeneration can, however, put at risk the animals which live in tree holes. Many birds and some small mammals use tree holes for nests and shelter. However, these species are accommodated in the extensive reserves and in the network of conservation zones along roads, rivers and streams. These areas provide extensive habitat for hole-nesting animals, and a resource for the recolonisation of new forests grown after timber harvest.

FRESH WATER FROM THE FOREST

The capacity to produce fresh water is one of the karri forest's priceless assets. So important is fresh water in W.A. that a massive, multidisciplinary research project was launched some years ago to discover which influences, such as clearing for agriculture, mining and timber cutting, had the potential to cause deterioration in our water supplies. This was done as part of the environmental study program upon which the Environmental Protection Authority was to base its approval for W.A.'s woodchip industry.

This research has established that the fresh water resource in the karri forest is very secure, provided careful forest management practices are followed. For example, it is important that zones of undisturbed forest are maintained along major rivers and streams. Where logging and regeneration occurs, measures need to be taken to prevent muddy water flowing from access roads into streams.

Protective measures such as these have been part of routine forest management in the karri forest for many years.

An important outcome of the water resource research in W.A.'s south-west was to confirm that after a century of logging, regeneration and recreational use, no river or stream in the karri forest has turned saline (other than where salty water has flowed in from agricultural areas). The research has highlighted a remarkable and fortunate compatibility between fresh water and other resource management in this forest.

Jiri Lochman

Jiri Lochman

Alan Sands

Water: the liquid of life for the froglet and the purple Karri dampiera *(top) along with the people who also use it for their favourite form of recreation (above).*

SUSTAINING RECREATION

Multiple-use forests are widely used for recreation. In most instances, this has little impact on the environment. But places of exceptional recreation value - such as good viewing points, shady nooks and unique groves of trees - can deteriorate quickly from overuse, particularly by human trampling which causes vegetation loss and soil compaction. In such cases, walkers must be channelled along surfaced or raised pathways, with facilities such as carparks and camping and picnic areas located away from the sensitive area and designed to blend in to the natural landscape. It is also essential that recreational use of the forest does not spread disease or start fires.

CALM's landscape architects and recreation specialists have designed and supervised the construction of dozens of recreation sites in the karri forest over the past 20 years. The aim is to ensure that the forest is enjoyed, but does not deteriorate from use by recreationists.

The new forests regrown after timber harvest contain numerous popular recreation spots. While people love to visit the mature forests in national parks, surveys have shown they also have a keen interest in multiple-use forests. A wider range of recreational activities are allowed in these areas. Firewood and craftwood can be collected, dogs and horses can be exercised, boats can be powered, car rallies can be held, and rules regarding access and camping are more relaxed. In many places, old mill and forestry settlements within State forest have been developed for picnicking and camping, or as interpretive sites.

Within the karri forest, recreational opportunities in nature reserves, national parks and State forest complement one another.

A special value of State forest is that it has the capacity to absorb a wide range of popular recreational uses, thereby easing the pressure on national parks and nature reserves and enabling them to retain the undisturbed stands which cannot be maintained in areas where timber cutting and regeneration occur.

SUSTAINING TIMBER PRODUCTION

Karri is one of the finest timbers in the world. It is strong, can be produced in long lengths and can be used for heavy construction, furniture or paper pulp. The associated species, marri, also has a fine timber but its logs are of much lower quality, making sawn timber production less economical.

A large industry, based on the use of karri timber, has flourished since the late 19th century. Today, the industry employs thousands of West Australians and continues to draw karri and marri logs from the forest for timber and paper supplies.

For the forest to sustain long-term timber production, the rate of harvest and the rate of forest replenishment must be in equilibrium. Successful replenishment requires an understanding of forest growth and regeneration and the capacity to protect forests from damage. The scientific disciplines involved are known as Yield Regulation and Silviculture.

Cliff Winfield

Cliff Winfield

Karri is one of the world's strongest and toughest timbers (above).

A massive log truck thunders out of the forest (above).

YIELD REGULATION

To keep the rate of harvest within the rate of natural replenishment, tree growth rates must first be determined. Then measures to restrict the rate of harvest to a calculated sustainable rate must be devised. Calculating a forest's 'permissible yield' is very complex. It involves factors which constantly change. For example, tree growth rates vary with age and seasons, and changing economic and market factors influence log marketability. So permissible yields must be continually recalculated, and the annual harvest level must be constantly under review.

If the total volume of wood was the only consideration, the existing rate of harvest in the karri forest could be easily maintained. This is because growth each year in the forest greatly exceeds annual harvest. However, the present level of sawlog harvest (which is a component of the total harvest) is being progressively reduced over the next few years. This is because much of the present growth is on trees which are too young to be 'counted' as sawlog resource. Over the next 30 or 40 years, these trees will become large enough to yield valuable sawlogs. Consequently, by the year 2030, the permissible yield of sawlogs in the karri forest will greatly increase.

SILVICULTURE

A fundamental law of good forestry is that harvested areas must be regenerated. Silviculture is the science which deals with forest regeneration and regrowth. Almost every forest has different regeneration requirements and management must vary to suit these requirements.

There are a wide variety of systematic approaches to forest harvest and regeneration, called Silvicultural Systems. Although they have numerous names, all silvicultural systems are a variation on one simple theme: a single tree, or group of trees, is harvested for timber, and in the resultant gap, new trees are established and nurtured. When single tree or small gaps are established this is usually referred to as 'Selection Cutting'. When large gaps (up to many hectares in size) are made, the method is called 'Clearfelling'. Both approaches have the same end result: older trees are replaced by younger ones which in turn become old trees again, and so the cycle is repeated.

During the past century, karri forests have been regenerated by both clearfelling and selection methods and this experience has shown that both methods are feasible for regeneration. Each approach has its positive and negative aspects. For example, clearfelling is simpler, more economical, more reliable and produces higher yields of timber in the new forest. Management of the new even-aged forests is quite straightforward. This is the method which is currently favoured.

Selection cutting, on the other hand, is costly and difficult; much larger areas need to be cut over to produce the same volume of timber. This method is, however, more visibly acceptable. The sight

of a recently clearfelled area upsets most people, even when they understand that a new forest will soon grow. The temporary ugliness of clearfelling is a major factor responsible for public opposition to timber production in the karri forest.

Whichever system is used, the art and science of regenerating karri forest after timber cutting is well known and successfully practised. New forests, such as those at Boranup, Big Brook, Treen Brook, Diamond and Channybearup, are living examples of this success. These new forests also provide for flora and fauna conservation, recreation and water supply. during the 'dry' in mid-1987 when

Cliff Winfield

FIRE PROTECTION

Since forests are living things, disease and injury are always potential problems. Fortunately, the karri forest is remarkably healthy and free from pests. However, bushfires pose a constant and serious threat.

Fires start each year in the forest. Intense summer wildfires can kill karri trees and threaten human lives in towns and on neighbouring farms.

Marie Lochman

New forest established after clearfelling at Boranup (top). This area is to be included in a national park .

Low intensity fires are used to reduce fuels and so minimise the damage from wildfires (above).

After more than 70 years' experience, karri forest managers have found only one way to reduce the threat of wildfire. This is to reduce forest fuels by prescribed burning in times of low fire danger. Wildfires in recently burnt areas are less intense and can be readily brought under control.

Fire protection is achieved through the preparation and application of fire management plans for every section of the forest. These plans show the areas where fuel reduction burning is to be conducted, as well as areas where the aim is to exclude fire, or burn only to promote regeneration. Months of work go into these fire protection measures every year. The burning itself is carried out under mild weather conditions so as to ensure low fire intensity. Consecutive burns on the same area occur only about every eight or nine years.

Some people oppose prescribed burning, claiming it causes undesirable ecological damage. However, scientific research has not been able to detect any major ecological problems. For forest managers, the burning program is the only practical way to minimise the threat of bushfires and the undesirable social and economic damage they cause. Prescribed burning does not stop fires occurring, nor does it absolve CALM from the effort and expense of being vigilant, organised, trained and equipped to fight fires. What it does do, however, is give us the chance to win when a forest fire starts.

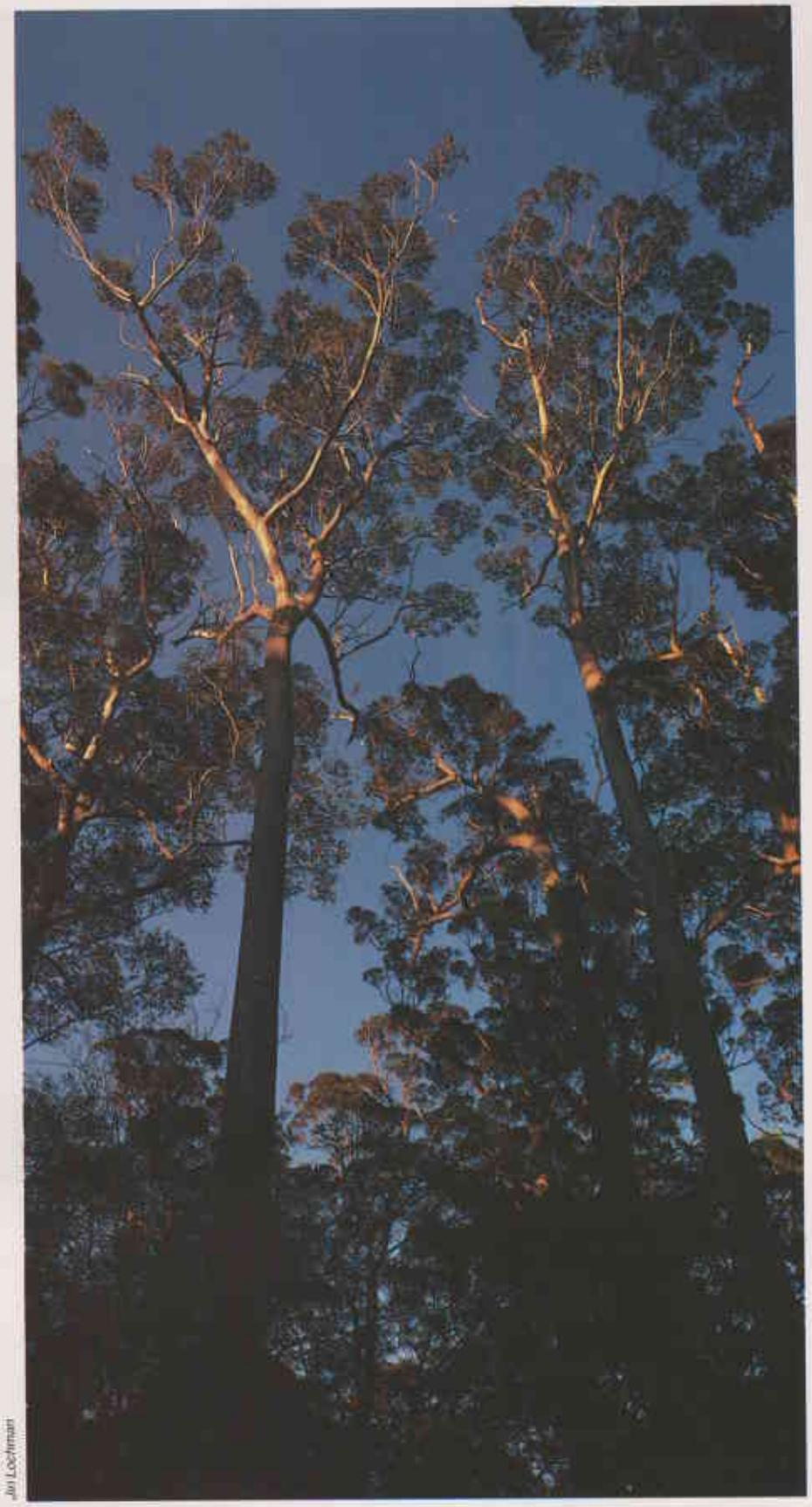
Robert Karri-Davies

Ferns, and many other plants in the understorey, create a colourful carpet on the forest floor.

LOOKING TO THE FUTURE

The management of karri forest to sustain its many values is a complex and demanding task. The system must cater for flora and fauna conservation, provide a range of recreational opportunities, and ensure that renewable resources of fresh water and timber are conserved.

CALM is determined that its approach to this complex job must be thoroughly professional and socially responsible. We accept that there will always be opportunities to further improve the quality of management. For example, although a reserve system has been established, there are still concerns about our ability to protect these reserves, particularly from fierce summer bushfires. We are also concerned about the visual impact of timber harvest and regeneration. Current research is providing new guidelines and checks for field officers planning and supervising this job.



Jiri Lochman

Finally, there is a challenge outside State forests. About 20 per cent of the original karri forest is privately owned and most of this area has been cleared for agriculture. Given voluntary farmer participation in economic private tree growing schemes, there is a good prospect that a proportion of the State's future timber needs could come from these private lands. Such schemes would have numerous ancillary environmental and social benefits for the south-west region.

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EDITORIAL

A prerequisite for the successful management of land and wildlife is an understanding of the processes that drive ecosystems, and managers who can manipulate these processes.

In Western Australia, we are fortunate that we have a wealth of talent in different government agencies, tertiary institutions and private companies who can provide these research and management skills.

Of course, obtaining a perfect understanding of ecosystems and ways to manage them brings to mind the frog who wants to reach a creek, but can only jump half the distance every time.

But it is not the complexities of understanding or managing ecosystems which provide the greatest difficulty.

Social and political factors are far more difficult to accommodate.

All the scientific and managerial skills in the world are worth nothing if the community and, often more importantly, selected constituencies within the community do not support the management strategies.

Unfortunately, there is often an inverse relationship between a scientist's or manager's skills in his profession and his capacity to handle social and political factors in the community. This is not surprising, since most scientists and managers have received little training in basic communication skills, let alone community politics.

CALM is attempting to address this problem in a variety of ways. But the people who should know the most about how to obtain community support for public land management strategies are the public. *Landscope* readers are an important and influential constituency. If you have thoughts on this issue we would like to hear from you.

What a sterling idea! A new management plan for CALM's South Coast Region - page 28.

Are insects gradually eating away our jarrah forests? Turn to page 18.

What lies beneath the waters of Marmion Marine Park? See page 25.

COVER

A rose by any other name... Does its name detract from the beauty of the common eggfly (Hypolimnas bolina)? *Photograph - Jiri Lochman*

FEATURES

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