

Timber conflict 'inevitable' says LEAF seminar speaker

THE polarisation which exists on the timber issue is destructive, and although it may pass, it will only pass after an active effort by people, with a desire on both sides to do that.

That was stated by Dr Sydney Shea, of Western Australia, addressing a seminar on timber aspects in South Grafton yesterday.

Organised by LEAF locally, the seminar was initiated by the Joseph William Gottstein Memorial Trust, the three speakers being Gottstein Fellows.

Dr Shea brought to the seminar a picture of Jarrah dieback in Western Australia and some of the ecology problems associated with it.

Referring to the confrontation between the timber industry and conservationists and environmentalists, he said he had found the level of debate in the United States more mature.

"There is inevitable conflict", he said, "but we must get the fact over that there is need for better understanding, and understanding of forests."

In Western Australia, he said he had been amazed at the amount of co-operation he had received when measures were introduced to combat the Jarrah dieback, and attempt to halt its spread.

"However, if the sort of information we are gathering is taken out of context, it makes implementation extremely difficult," he said.

"Certain groups may use the experiments to criticise." He instanced the film "On the Edge of the Forest", which was shown at the National Parks' Association in Grafton on Saturday.

He said some of the statements made in the film, which used clips from the files of his department, had been out of context, and had made it very difficult for him to continue the research.

"The situation today is one of confrontation, but confrontation will not get us anywhere.

"Because of the confrontation and the displaying of problems we have a tremendous opportunity to do something for our forests and to ensure them surviving in the future.

"We must be constructive in the whole issue of environment and conservation," Dr Shea said.

Mrs Nanette Oates said in the environment controversy which had arisen, the timber industry had become the butt of a lot of criticism.

She spoke of ways the timber industry could look at the utilisation of resources, looking towards encouraging private landowners to have native forests on their properties to manage them in a positive sense, rather than as a bit of useless bush.

Mrs Oates stressed

the importance of the timber industry to rural communities, not only for giving people jobs and income within the community, but the fact that they, in turn, added to the real wealth of the community by the use of local shops, local doctors, local clubs.

Conservationists could not expect tourism to generate that amount of economic activity and diversity in an area.

If tourism could take the place of the timber industry, tourism would have to increase to such an extent that it would probably destroy the tourist value of the forests, she said.

Mr Thorry Gunnensen said there was a general media bias against the industry which the industry should work to overcome.

It was necessary to distribute facts. He said there was a more sophisticated approach to education in the United States.

The industry had to recognise the climate of the conservationist and get involved in a more mature way, he said.

A panel, which comprises the speakers, Mr Lindsay Chapman and Mr D. Wilkinson, and which was chaired by Mr Doug Howick, competently handled a wide variety of questions.

They ranged from the management of catchment areas, the use of catchment management to reduce salinity and improve water resources, government loans for re-forestation projects, government assistance for native Australian forests, plantings by communities and individuals as well as companies and the industry, the emphasis that foresters were conservationists and environmentalists to the public participation in management of forests.



SEMINAR ATTRACTS WIDE ATTENDANCE

CONCERNED people representing the timber industry, Forestry departments, conservation groups, from Queensland and all sections of the North Coast, heard speakers from Western Australia and Victoria yesterday on the place of the timber industry in the environment of the 1980s.

One group came by charter plane from Toowoomba.

The seminar at the South Grafton Ex'servicemen's Club, was initiated by the

Joseph William Gottstein Memorial Trust, of Victoria. Local organisation was carried out by L.E.A.F.

Mr Lindsay Chapman, managing director of Allen Taylor Pty Ltd and a member of the Board of Management of the Trust said it was established in memory of Joseph William Gottstein, a leading Australian research scientist in forestry, regarded as a world authority in the field.

He came from Ipswich and worked in the Queensland Forest Service before joining the CSIRO. He was killed by a falling tree when working in New Guinea on a research project.

Mr Chapman said the Trust awards fellowships to applicants to study subjects which are allied to the forests, forest products, industry either in forestry, plywood or sawn timber, in their manufacture or their use.

In the case of the three speakers Mr Thorry Gunnensen, managing director of Marbutt Gunnensen, Melbourne, studied in the United States, Nanette Oates, Editor of the Australian Forest Grower in Australia, and Sydney Shea, senior scientist with the Department of Forests, Western Australia, in Australia and Canada under the trust.

Mr Chapman said the purpose of the seminars was educational, to educate people in forest industries in attitudes and things they needed to understand regarding environmental problems.

It is important to avoid confrontation between the industry and the public, he said.

Mr Chapman said a similar seminar will be held in Sydney today, and one in Melbourne tomorrow, with the same speakers.

Seminars would also be held in other places, he said.



A dieback graveyard in the Dwellingup area.

ADVANCES MADE IN WAR ON DIEBACK

By ALEX HARRIS

FOR the first time since jarrah dieback was identified in WA's forests 15 years ago Forests Department scientists believe they have a chance of controlling the disease.

While it is too early for unqualified confidence they can at last see a halt to the lingering death of some of the State's finest trees.

Their optimism rests on four important discoveries:

- An understanding of the life cycle of the fungus—*Phytophthora cinnamomi*—that causes dieback.

- Successful, though limited, field demonstrations that some native acacias can suppress the disease.

- The development of a pilot fire regime to manage the environment and control the fungus over a wider area.

- The discovery of surface-feeding root pads in jarrah—but not so far as is known in any other eucalypts—that make it particularly vulnerable to fungus attacks.

These findings are the result of six years' intensive work by a handful of scientists led by Dr S. R. Shea, head of the department's Dwellingup research team.

Dr Shea is a dogged enthusiast whose love for the jarrah tree is equalled only by his admiration of its ability to survive in some of the world's poorest soil.

His attempts to crack the dieback code took him far beyond conventional forestry to become something of an authority on soil microbiology, geomorphology, hydrology and fire ecology.

In doing so he gained an extraordinary insight into the forest environment. This made possible a series of imaginative leaps from one discipline to

another that led to the present discoveries.

Because of the scope of the problem and the rate of forest destruction they have been rushed into field trials at a rate that leaves laboratory-bound researchers juggling their slides in astonishment.

"What we have done so far could, I think, work in the long term," Dr Shea said this week.

"We've had to take a punt and begin our trials earlier than we would have liked because time was against us.

"But we now have a joint programme with Mr Jan Titze's group at CSIRO and inputs from Alcoa.

"If things turn out as we hope we will have to think of a way to fine-tune the forest environment as quickly as possible to get a broad dieback control programme underway."

Hard to find

To date one of the big problems with *Phytophthora* has been that, despite its great destructive ability, it could not easily be found in the Darling Range soil, though research workers had no trouble doing so in wetter eucalypt forests in other parts of Australia.

The reason is that WA's jarrah forests grow in a Mediterranean climate on ancient, infertile soils.

Dr Shea argued that the fungus would behave differently under these conditions and, in fact, occurred as an ephemeral soil organism for only a short time each year.

Foresters knew that the bull banksia was highly susceptible to dieback and that fungal invasions occurred even in the big roots.



A photograph taken using an electron microscope to show a chlamydospore forming on the *Phytophthora* mycelium. The mycelium is the fungus's vegetative phase, when it consists of microscopic tubular structures. The thick-walled, ball-shaped chlamydospore is a resting stage in the fungus's life cycle which allows it to survive in moist soil during summer.

What they did not know till quite recently was that it could also move into the stump, where it set up a collar rot that was an ideal springboard for future outbreaks—one of the great ironies of dieback research, since *Phytophthora* was described as a collar rot when it was first isolated on cinnamon trees in Java in 1912.

Dr Shea went on to hypothesise that the fungus, therefore, had to move into the soil at some time to attack the roots of species like jarrah that are not subject to total root invasion.

It took him and his team 14 months and 7000 separate soil samplings to discover that this happened for a short time in spring when the moisture and temperature were right.

Risk periods

"Although the fungus can be transmitted in the soil at any time we know now there are high-risk periods," he said. "This gives us the basis of a management programme for the future."

The department's second major advance followed logically on the first.

The only practical control of dieback depends on manipulating the forest environment so the fungus cannot operate as an ephemeral micro-organism.

During the past two years the Dwellingup team extended its work to show that the use of legumes to suppress sporangial production—the mechanism that allows *Phytophthora* to build up rapidly during spring—can work in the field as well as the laboratory.

This is a world "first" but the legumes show other promise as well,

needed to bring about these changes," Dr Shea said.

"I think we have been able to show it can be done. We also have evidence that the fires stimulate tree and wildflower growth."

The department is upgrading its research programme to carry out more tests and next summer will do a series of bigger, moderate-intensity burns.

The final point in the current series of breakthroughs is the discovery that the pads of surface-feeding roots the jarrah has in common with the bull banksia are a prime site of dieback infection.

The jarrah's big, stabilising roots resist the disease but these small feeder systems are what it lives by, to extract every nutrient possible from a leached-out landscape.

Starving

Their destruction could be the reason why an infected tree dies so slowly—literally of starvation.

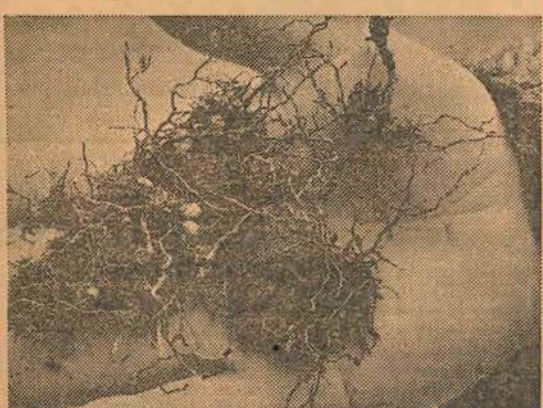
Dr Shea, who first suspected the connection, is working on a three-year series of field and glasshouse trials with Dr B. Dell, of Murdoch University, to resolve the question.

Today he finds it hard to believe so much has been achieved by a small team whose maximum strength was always fewer than 10 men.

"Six years ago the prophets of doom were telling the department the forest was lost and there was no need to worry where bauxite was mined because the entire area was a write-off," he said.

"There was a danger these prophecies could have become self-fulfilling.

"We still have a long way to go but that kind of thinking is no longer justified."



A close-up of the newly-discovered fine feeding roots of the jarrah. Most have already been killed by *Phytophthora*. The small nodules are gravel pebbles, around which the roots have formed. These feeding roots, which are highly susceptible to dieback disease, occur in "pads" as they do in the bull banksia. So far as is known they do not occur in other eucalypts.

Burning could hold key to dieback

By ALEX HARRIS, who talked to the WA Forests Department about its plans and reasons for having a trial burn in the summer.

TOWARDS the end of this month, with foresters living on their nerves waiting for the next bush-fire alert, the Forests Department will run a summer burning trial near Dwellingup that could hold the key to controlling dieback.

Its aim is to juggle the forest environment by bringing on a good winter growth of acacias and getting rid of big colonies of surplus banksias.

The acacias, especially the common prickly Moses which brightens Perth's winter landscapes, fix nitrogen in the soil.

They are also believed to produce a chemical that inhibits the spread of phytophthora cinnamomi, the fungus that causes dieback.

The combined effect, if it can be demonstrated in field conditions, will give the endangered jarrah a fighting chance of survival.

On the other hand, the banksias have been identified as a pest in many areas following the opening of the forest canopy after timber cutting.

Last year, the head of the department's Dwellingup research station, Dr S. Shea, found they had a more sinister role—they act as a resting place for the fungus until conditions are ripe for it to explode in another outbreak of disease.

This summer's big burn is designed to test these findings on a broad basis.

"Burning during the bushfire season cuts across decades of forest management policy," the officer in charge of the fire protection branch, Mr George Peet, said.

"But what we know about the role of acacias and banksias represents the best lead we have to dieback control.

"In the short term, at least, it's this or nothing.

"We can't afford not to carry out the trial."

The burn will be confined to a 2000-hectare block of mixed forest about 120km south-east of Perth near the Murray River.

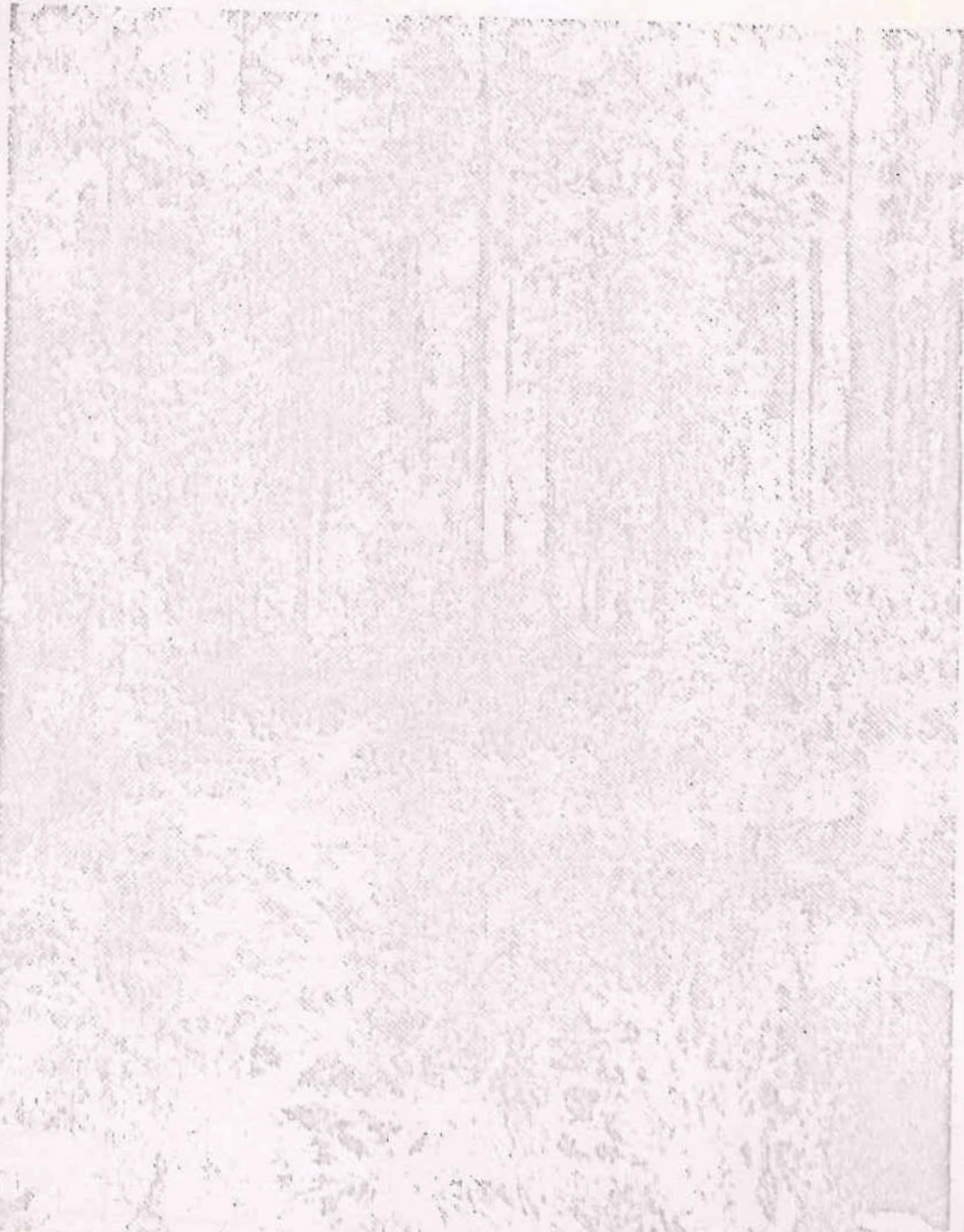
The reason for a midsummer burn has largely been debated by the ants.

"The insects store acacia seeds up to 10 cm below the ground surface," Mr Peet said. "Under normal conditions many of these do not germinate because acacias, like other native plants, need fire to get them started.

"By waiting until weather conditions are right and the soil is completely dry we can build up enough heat to reach the seed stores.



A small trial burn at Pindalup, near the burn area. The Forests Department has gone to great lengths to ensure that this year's summer burn will be as safe as possible.



The department hopes to encourage a thick undergrowth of acacias, as in this section of bush, by burning in the summer.

Before the department could consider the burn it had to convince local authorities and the Bushfires Board that its scheme was as foolproof as human ingenuity could make it.

A clearance was eventually given and an extraordinarily detailed programme worked out.

It began about four months ago during the spring burning season when foresters began to prepare a firebreak, a kilometre wide at its narrowest point round the trial area.

For the past three months the fire management officer, Mr Paul Jones, has been working out a strategy for the burn.

Firefighters from the

Jarrahdale, Dwellingup and Harvey forestry divisions will be brought in to back up the normal fire control crews.

The burn area has been mapped and gridded.

Scientific monitoring equipment is being set up to measure wind, smoke and fire intensities.

Earth moving machinery, radio-controlled communications systems, extra water tankers, food and first aid units will be on hand.

An intelligence and control network will operate continuously to keep track of the fire's progress.

The fire will be lit by aircraft and a special spotter plane will patrol the forest canopy to report any spread across the huge buffer zone.

Each firefighting and monitoring crew will be responsible for its own section, with overall supervision by top forestry scientists and a Bushfires Board officer.

Mr Peet said the heat intensity would be from three to five times that of a normal spring burn.

"The trial area of 2000 hectares has been split into two," he said.

"The western half will be lit about 3pm and burn for three hours. This more intense burn is to destroy banksia seeds, seedlings and trees, as well as coax the acacias into readiness for the autumn rains.

"The eastern half will be lit at 6pm and burn to 11pm under milder conditions.

"We have to strike a balance between damaging the jarrah and getting the best germination of acacias."

The criteria for a summer burning trial rest on several factors.

Dieback must be present in the stand and there must be a reasonable population of big, mature jarrah trees that can withstand the heat.

There must also be a reasonable certainty of acacia regeneration, over an area big enough for new thickets to develop despite heavy grazing pressure from native animals.

A close check will be kept on fauna numbers.

The department's biologist, Dr Per Christensen, who is stationed at Manjimup, has done a survey of the block and will follow it up after the burn and as the acacias regenerate.

"We were also thinking of setting aside about 10 hectares for logging, but could not find a suitable block with over-mature trees and a few saplings," Mr Peet said.

"What we'd like to know is whether it's possible to get a good germination of seedling jarrah so we may be able to recreate a new forest with an acacia understorey and built in protection against dieback."

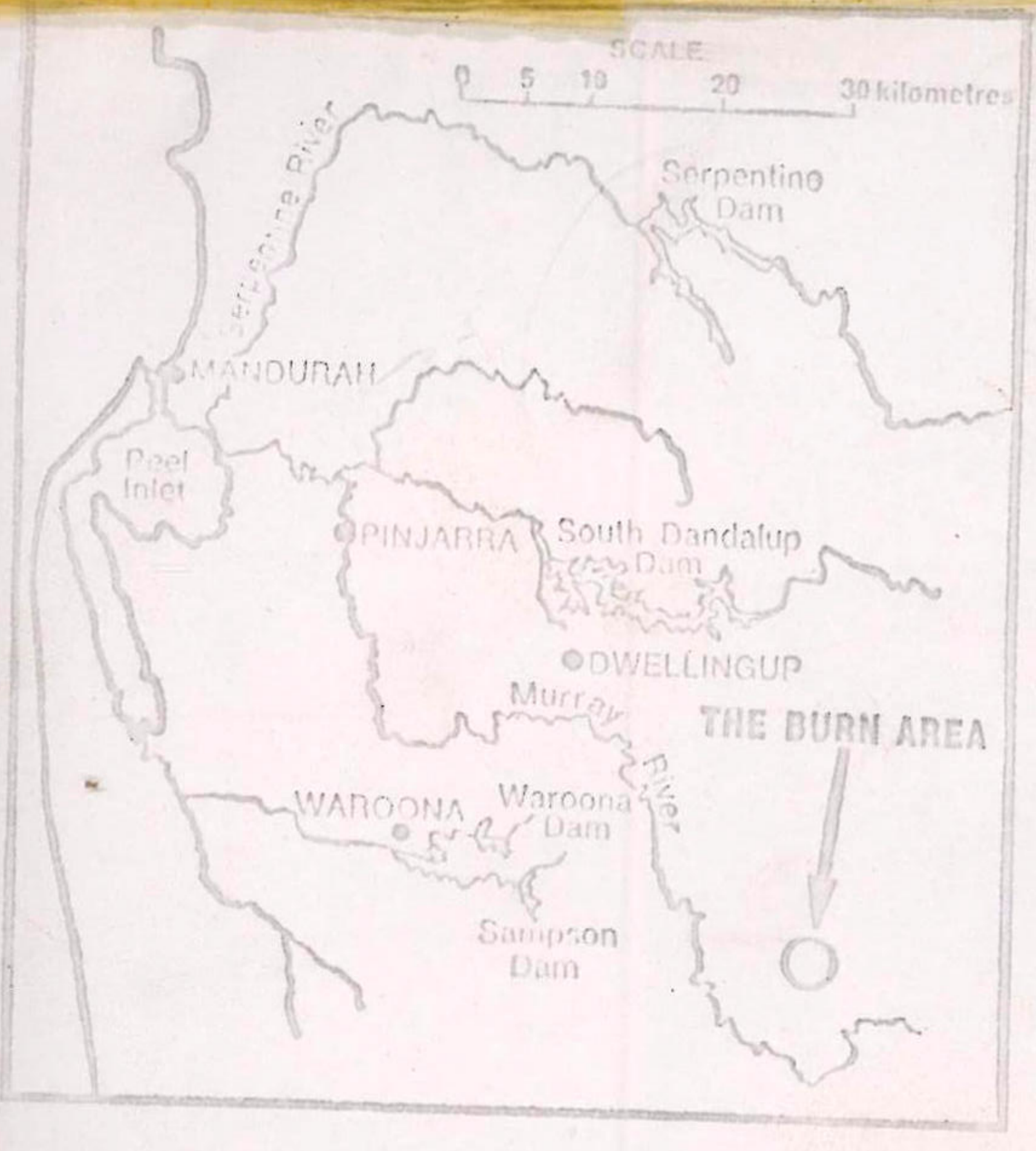
The Dwellingup burn will probably be followed next summer by much bigger ones, in about 10,000 hectares of forest near Harvey.

"The idea is to test the acacia theory under as many conditions as possible," Mr Peet said.

"There are a lot of questions still to be answered.

"On what sites can we guarantee a regeneration of acacia thickets, what is the minimum fire intensity needed for regenerating acacias, and killing banksias, and what will be the damage to standing timber?"

"When we find them we could be at the beginning of a new era in fire control policy, using fire for a specific end in land-use management. In this case it is dieback control but other uses could arise in the future. In the past we have used fire only to reduce hazards and, in the south, to regenerate karri."



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Bauxite debate

It is time the bauxite mining debate was put on a more rational plane, free from extravagant claims by proponents and antagonists. That involves acknowledgment of the motives of each side.

The Government cannot be characterised as being hell-bent on development without regard for risks. It is seeking expansion of an industry that holds considerable economic benefits for the State and the nation. It is not issuing a blank cheque for destruction; it is insisting on stringent environmental safeguards never imagined when bauxite mining first began in WA.

Nor should the role of conservationists be decried. Their concern has been the focus of public attention and has increased community consciousness of the key issue—that water supplies and a unique forest are more valuable assets than bauxite.

Mining companies must now be acutely aware that public opinion is a powerful factor that will help to shape their destinies.

However, there is really nothing to be gained from further delays to the legislation covering agreements for the Worsley and Wagerup alumina refineries. None of the reports that are imminent will give unequivocal answers to the big questions that have been raised. But delays could cause a great deal to be lost. The longer the argument drags on the more questionable will become the viability of the bauxite projects.

In considering the environmental issues it is important to recognise that there are parts of the forest that are not worth preserving and which can be mined without threat to water supplies. In such areas bauxite mining can be compatible with environmental considerations. They can also provide a safety period in which more information can be gathered.

That is another important point. The future will bring not only expansion of the bauxite industry but also greater knowledge of the industry's environmental impact—knowledge that will enable a halt to be called if any threat should begin to materialise.

Surveillance

The legislation before Parliament provides an impressive array of environmental safeguards and a requirement for continuing surveillance. Approval of environmental review and management programmes will be a condition of development.

But it cannot be stressed too strongly that the safeguard system alone is not enough. How it is administered is more important than the machinery itself.

Furthermore, there should be no question of secrecy about environmental monitoring programmes. There is an overwhelming case for the results to be presented to Parliament. If the public is properly informed it can make proper judgments.

Bauxite mining companies now have to live with two new and significant facts. The first is that they will have to trim their activities to a point where they will be acceptable to both the main political parties. Today's Opposition can be tomorrow's Government.

The second is that public interest, intensified by the conservationists, will ensure that the companies, the forest and our water supplies will be under constant scrutiny.

Options for WA jarrah areas

Dr J. S. BEARD, Applecross: The report by the WA branch of the Australian Institute of Foresters on bauxite mining in the Darling Range (April 26) states admirably the case for the jarrah forest, but as is usual when someone is pleading one side of the case it does not adequately discuss side issues and alternatives.

The public should be told clearly that while there is an obvious case for the retention of as much jarrah forest as possible on aesthetic and sentimental grounds, there is none on economic grounds.

Jarrah, due to the difficult climatic and soil conditions under which it grows, has a low production rate per hectare per annum, so low in fact that the jarrah forest is doubtfully economic.

Jarrah is one of the world's prime hardwoods but the consumer would prefer to have softwood for most purposes if he could get it. Building costs in WA are increased by having to use jarrah for so many purposes for which it is not really suited. Areas lost to the jarrah forest by mining can therefore be advantageously balanced by pine plantings elsewhere such as in the Sunland scheme where particularly poor jarrah is being replaced by pines giving 20 times the yield.

CATCHMENTS

The Institute of Foresters makes too much of the salinity problem by assuming that there is no alternative to tree-covered catchments.

Again, the public should be told clearly that tree-covered catchments under Australian conditions are extremely inefficient for water yield. The trees take up so much of the rainfall that only a small proportion of it, from 10 per cent in the wettest areas to 1 per cent in the driest, finds its way into the reservoirs.

A grass-covered catchment would yield far more water, but in WA we have the peculiar problem that if the trees are removed salinity rises. This does not prove that a tree-covered catchment is the only alternative, and it is high time that we in WA with the critical importance of water, began looking at the practicability of paved catchments.

If one-sixteenth only of the catchment of the Canning or Serpentine dams were to be paved with concrete or bitumen it would give the same

water yield as the whole catchment does now, and virtually salt-free too, leaving the rest of the catchment available for forestry, recreation, bauxite mining or any other purpose.

This solution must be looked at because it is the only way in which in the future our water supplies can be increased. Pave another sixteenth of the catchment and you double water yield; if you can also double storage, you will double available water supplies.

WA gets plenty of rainfall; the problem is to collect it.

Protesters set up anti-bauxite camp on mountain top

By MICHAEL SINCLAIR-JONES

A tent pitched on the summit of Mt William, deep in jarrah forest about 110km south of Perth, has become the focal point of the campaign to stop expansion of bauxite mining in the Darling Range.

About 50 men, women and children yesterday helped to establish a protest camp about 500 metres above sea level to highlight their plea to preserve native forests.

Mt William is the heart of a rich bauxite ore body, which will be mined by Alcoa if the Alumina Refinery (Wage-rup) Agreement Act Amendment Bill is passed in Parliament.

The lush green jarrah forest covering Mt William is in sharp contrast to the surrounding valleys where poorer drainage and soil has helped the spread of dieback disease.

All the way up the slope there are mining survey pegs marked with coloured tape.

At the top of Mt William there is a cleared area with a forestry lookout tower, a radio mast and a windmill generator.

VIEWES

It is the highest point for kilometres, with unbroken views across to the Harvey Inlet and eastwards into the depths of the State forest.

About 25 vehicles made the ascent up steep gravel tracks yesterday.

The cloud cover cleared briefly during a break in the drizzle while volunteers drove stakes into the ground for a big blue marquee.

Soon the tent was up and a fire lit while a retired forester, Mr John Thomson (75), of South Perth, explained why he was going to spend the night in the damp, chilly tent with about 20 companions.

"Twelve months ago I flew over the choicest jarrah forests in the South-West and it was like looking down on the back of a mangy dog," he said.

DISGUSTED

"I have known what a jarrah forest looks like in its virgin state with clean floor and full canopy. It disgusts me to see what it has become.

"Before the Forests Department was created in the 1920s people had not realised the carnage created by the timber industry and unlimited chopping.



Mr John Thomson



Cecile O'Connor

"In those days we had sick, run-down forrests and today it is no different, with the dieback fungus disease rampant.

"Here at Mt William is a remnant of the choice-quality forest.

"There is no dieback because our best jarrah forest grows on well-drained gravel soils such as this.

"But if there is mining here, they will kill every tree, push away a few centimetres of topsoil and remove every last bit of gravel because it contains bauxite.

"That is why I will be sleeping here tonight in my old bush blanket.

"Decisions made here will affect this forest for the next 1000 years or more.

"I can sleep here under the stars and think about how I can help stop the Government from ruining our heritage."

CHILD'S VIEW

Cecile O'Connor (11), of Wembley, said she was at the camp because "they are going to blast

the mountain and take the trees away."

"She said: "I had a fight with a boy across the road. He said we should have mines because they make money for Australia.

"I said we need trees.

"It is silly to go around knocking down trees. I am here because I want to stop this happening."

As the rain started again and people began eating picnic lunches spread on blankets inside the tent it was obvious that some of the protesters were seasoned campaigners.

They wore anti-uranium badges, anti-whaling badges and solar fuel badges galore.

Ironically, some people had drinks in cans made of aluminium.

The camp leader, Mr Neil Bartholomaeus, said that communication with Perth would be kept by a CB radio relay link through nearby Waroona.

"We will be staying here as long as people want to continue this protest," he said.

Alwest assurance on environment

Alwest would welcome the closest co-operation with the State Government on environmental problems arising out of bauxite mining in the far eastern zone of the Darling Range, the general manager, Mr Walter Kommer, said yesterday.

Close co-operation was essential to protect the company's investment as well as the interests of WA.

"Like everyone else, the mining industry is on a learning curve," he said.

"But we know what questions to ask and we have gone a good way towards answering them.

"Our initial area of operations is well outside Perth's water-catchment areas.

"As more information becomes available in the next 20 years we will know whether we can proceed safely or whether we will have to change direction.

"Either way, we will have plenty of time to decide."

REPORTS

Mr Kommer was commenting on a report that Alwest hoped to go ahead with work on its Worsley alumina refinery by the end of this year.

The project, estimated to cost between \$700 million and \$1000 million, will process deep ore bodies at Mt Saddleback, near Boddington.

Export production is expected to begin early in 1982.

The Worsley refinery will employ 630 people.

Mining at Boddington is expected to revitalise the town, with additional permanent employment for 165 people.

Mr Kommer said that Alwest was planning to appoint a full-time ecologist to supervise clearing and revegetation of the mined areas.

The environmental staff would eventually include up to 12 specialists in various fields, including forestry and hydrology.

He said that the mined areas, which would be on privately owned and crown land, would be very deep but would extend over a relatively small area of the landscape.

Revegetation on privately owned land now cleared for farming or timber production would have to be brought up to the same standard as that applied to rehabilitated crown land.

It was too early to forecast accurately but some experts believed that in time this policy could reduce salinity in the Murray River, where high salt levels had resulted from heavy clearing in the catchment.

Mr Kommer said that the red-mud ponds used to hold liquid waste from alumina refineries had been a problem in loose, sandy soils but they would involve much smaller pollution risks at Worsley.

The soil in which the ponds would be built was heavier and much less caustic soda would be needed because of the

different composition of the rock from which the bauxite was taken.

In addition, a new process would be introduced to allow a big percentage of the red-mud waste to be handled in solid form.

War on dieback

The spread of jarrah dieback and the conservation of our water catchment area are inextricably linked in a situation which seems to be gaining little ground. Sheryl Fewster reviews the dieback dilemma.

A multi-million dollar war is being fought in the forests of WA — a war that is threatening to destroy the forest forever.

Slowly, but gradually the fight is starting to be won by the scientists, who originally got off to a flat-footed start.

The enemy has been studied extensively, examined in every possible way and is starting to be understood in a manner which must help bring its defeat.

The enemy is a disease caused by a soil-carried fungus, *Phytophthora cinnamomi*, or in non-scientific terms, jarrah dieback.

Widespread damage

It damages plants, not just jarrah, by attacking the root system and preventing the plant from drawing nutrients and so starving it to death.

A major breakthrough in the fight came in August when the Forests Department said that the bull banksia had been identified as a major reservoir of dieback infection in WA's jarrah forests.

The tree is highly susceptible to the disease and scientists have found that when the fungus enters an area, banksia are among the first to die.

It has also been established that the fungus can move through very big banksia roots.

The roots give protection and food to fungus while protecting it from elements where it could not normally survive.

According to the Forest Department's research team leader at Dwellingup, Dr S.R. Shea, it is the ability of the fungus to survive in banksia roots, even though outside conditions are unfavourable, that is causing many problems.

As trees died and more sun reached the forest floor, the temperature in the soil rose.

Better conditions for the *P. cinnamomi* fungus were then created, reproduction increased, and the fungus started to spread to less susceptible plants.

The foresters say bluntly that no attempts to control the disease are likely to succeed, unless the number of bull banksias in the forest is sharply reduced.

But the reduction is going to involve forest management techniques over several years.

Virgin jarrah forests contained banksias only as minor plant in the understorey. Most of the jarrah area, however, has been subject to varying degrees of cutting, burning, and regrowth, and banksia have proliferated. Heavy culling of banksia would be needed to return the forest to a more original condition.

Fire

Dr Shea said that mild hazard burns in spring had little negative effect on the banksia understorey; in fact, they helped establish a seedbed on the forest floor for seeds released from banksia cones the following autumn.

Intensive research at Dwellingup had shown that medium to high-intensity fires during the autumn and summer, when banksia were under drought stress, could kill more than 50 per cent of the understorey.

If the hot fire technique works when it is put into large-scale practice it will take more than 20 years to bring banksia numbers down to virgin forest levels.

Because of the time scale the fungus is also being attacked on other fronts using different techniques.

One project which highlights the seriousness of the disease and the extent to which the fight has been taken is the aerial photography programme.

The programme started in March this year and continued until the middle of winter when weather conditions made it unsuitable to continue. This year's programme is estimated to have cost the state government \$230,000.

It is anticipated that the programme will eventually cover 720,000 hectares of healthy forest quarantined to stop dieback spreading.

Unaided the fungus can spread only a few centimetres a year uphill or on a flat surface, but it can survive in less than one gramme of moist soil which is easily transported.

Downhill infection is rampant.

The photography is restricted by the weather because it is important that no shadow is cast.

Location

The film strips are viewed through three-dimensional viewers which enable indicator plants such as blackboys and banksias to be identified.

In this way the scientists can determine the rate of the spread and distance from existing infections.

The exact location of the infection can also be pin-pointed on a map to enable the scientists to get safe and hygienic access to the infection in an effort to treat it.

The future of the jarrah forest is important to metropolitan Perth because of the contribution the water catchment area makes to supplies of fresh water.

The Metropolitan Water Board's Forest Department estimates that...

It is the heavy dependence on catchment area water supplies that make the fight against dieback all the more important.

Increased salinity poses the single greatest threat to metropolitan water supplies and without native vegetation which is adapted to consume water, the salinity process is quickened.

Forest management has become the catch-cry of groups interested in preserving and restoring the forest.

Review committee

The State Government in August appointed a committee to review the use of the Darling Ranges. It will review bauxite mining in the range, the effects of woodchipping and dieback and proposed salinity and clearing controls.

Its chairman is the Conservator of Forests, Mr Bruce Beggs, and includes representatives from The Departments for Conservation and the Environment, Agriculture, Public Works, and the Water Board.

It also includes private industry members from the mining industry, the timber industry and agriculture.

The study team has been attacked by both the Labor Opposition and the Campaign to Save Native Forests as not having enough power.

Both groups want a royal commission type inquiry into the management and land use of the ranges.

They argue that the ranges have so much to offer to all residents of the metropolitan area that conflicts in use need to be sorted out now before it is too late.



Southern Focus
December
1979

Alcoa plans

It is a great pity that Mr Neil Bartholomaeus, of the Campaign to Save Native Forests, should have chosen to damn Alcoa's plans for bauxite mining east of Wagerup as a prescription for environmental disaster.

That kind of talk, and the unreasoning opposition it reflects, only serves to undermine the watchdog role that concerned citizens should be able to play in shaping the State's development.

The big difference between the approach of the environmental lobbies and that of the Government is that one side seeks to protect what exists, at the expense of development if necessary, while the other seeks development with the least practicable impact on the environment.

In looking at the jarrah forest, the main point is that dieback is the greatest threat and it will remain so regardless of whether bauxite is mined. Some healthy trees will certainly be felled in the 25 per cent of the initial mining area that is regarded as protectable against dieback. The remaining 75 per cent of the area is already lost to dieback and it is hard to imagine any convincing argument that a dead forest is preferable to revegetation.

Indeed, as Alcoa recognises, the biggest challenge will come when mining extends into areas of healthier forest and lower rainfall after 30-35 years. Salinity which, on the evidence, will not be a problem in the initial area will then have to be dealt with and the broad question of forest conservation will be more pressing.

We thus have about three decades in which to find an answer to dieback and management techniques to control salinity. If we fail to find them—and Alcoa is contributing substantially to the search—dieback and salinity will continue to spread regardless of mining.

The proposition for the Federal and State Governments and their environmental agencies in deciding whether to give final approval to the project boils down to the question whether its environmental drawbacks would outweigh its value in terms of the economy, employment and decentralisation.

Perhaps it would serve some theoretical democratic purpose if the matter were to be debated again in the State Parliament. But Parliament has already approved the project, leaving the final say effectively with Canberra—through export and monetary controls. It is hard to see what more could be said.

 **SUNDAY
INDEPENDENT
SAYS...**

ALCOA REPORT

ALCOA'S recent report on a proposed metallurgical test plant at Yeelirrie would satisfy the hardest environmental heart.

The study even includes bird sightings in the proposed area — from a purple-crowned lorikeet to an Australian crow. Soils, vegetation and fauna are carefully analysed.

It is in this climate of responsibility that this week's State Government decision to give the go ahead for development of refineries at Wagerup and Worsley must be judged.

Alcoa and the State Government are aware that it is vital to build in environmental safeguards. Both parties have been working together for a long time.

But it is also vital for the lay-environmentalists to realise that projects such as this one by Alcoa are essential for the economic well-being of the State.

It will mean a large decentralised industry, hundreds of permanent jobs, hundreds of construction jobs, site work for many local businesses and the injection of millions of dollars of capital investment into WA.

Already Alcoa is well advanced in a study of all the difficulties associated with its bauxite mining in WA.

It has demonstrated worldwide that it does not dodge responsibility in these areas.

It is hard to understand the NCP State Council's attitude to the proposed development.

The party wants a delay on the ground that the public will not have time to consider "all aspects of the vital issue".

The public at large is not in a position to study "all aspects". That is what it elects governments to do.

All West Australians should welcome the Alcoa expansion which comes at a time when the State is not exactly "on the move" — unless snail's pace is accepted as movement.

Call to limit bauxite to dieback areas

The West Australian hardwood timber industry wants bauxite mining restricted to areas already infested with dieback.

The industry says that if mining is allowed in parts of the forest that can be protected from dieback the timber industry will be adversely affected.

A spokesman for the industry, Mr G. W. Kelly, manager of Forest Products Association (WA), said that members of the industry had drawn up suggestions on how mining could operate in the areas already heavily infested by dieback, where timber cutting was not permitted.

But till prevention was found for dieback, mining should not be permitted in areas that could be protected from it.

The time taken to find the prevention might be more than the 10 years that the State Government had estimated be-

fore mines were established.

Mr Kelly said that the timber industry had already had to cut back because of dieback and had forgone 30 per cent of hardwood resources in the southern forest area after the woodchip inquiry because society claimed that the forest was needed for other purposes, such as reserves.

But the hardwood miller, who already faced the closure of a number of sawmills by the end of the year because of reduced stock, could not accept a further reduction of his growing stock by the possible introduction of dieback.

The stability of the hardwood market had already been shaken by a general belief that local hardwood would become

unavailable.

Mr Kelly said the industry suggested that:

- The proposed use of salt-sensitive areas should be given more serious investigation.

- There were enough bauxite deposits in areas already everely affected by die-back to fulfil the needs of the mining companies.

- The mining companies should be encouraged to improve the environment of the northern jarrah forest and be prepared to extend their interests outside the limits of rehabilitating only the mine pits.

- The timber industry could contribute objectively and provide practical suggestions based on experience and results provided by scientists of

the Forests Department and the CSIRO.

- The Forests Department's detailed study of land use of the northern jarrah forest and its recommendations should be the basis of management.

- The machinery to carry this out already existed in the specific function of the Environmental Protection Authority to "coordinate all activities, whether government or otherwise, as are necessary to protect nature or improve the environment."

- The EPA should recognise that big funds would be needed for environmental improvement work to be carried out in the case of bauxite mining and that it would be necessary to continue profitable mining operations.

Alcoa's trees stood firm

The high winds generated by cyclone Alby blew over only 20 trees in Alcoa's 700,000-tree rehabilitation programme in the Darling Range.

or less than one-tenth of one per cent, of WA's State forests had been cleared for mining and subsequent rehabilitation.

A spokesman said yesterday that the trees were dispersed over three mine sites.

The winds were reported to have reached more than 120km/h in some places.

The spokesman said that the 700,000 plantings had been established at Alcoa's Jarrahdale, Huntly and Del Park sites since the company and the Forests Department began the rehabilitation programme 12 years ago.

Before cyclone Alby they had survived the worst three years of drought recorded in WA.

Their ability to withstand the high winds was further evidence of satisfactory root penetration and a measure of the programme's success.

The spokesman said that since bauxite mining began 16 years ago Alcoa had rehabilitated 915 hectares of land. Another 242 hectares would be rehabilitated without further clearing by June this year.

A total of 1985 hectares,

A question

IN VIEW of the widespread concern that unrestricted bauxite-mining could result in the complete destruction of all of WA's forests, should not the Premier, Sir Charles Court, assure the public that the only trees endangered will be those with a decided leaning to the left?—Desmond Keating, Crawley.



International Cooking Month

FREE DEMONSTRATION

This is the last of the current series of cooking demonstrations conducted by Liz Whichello of the State Energy Commission.

TOMORROW 12.30-2 P.M.

Cooking of Japan

Featuring the international cooking expert Linda Quo who is widely experienced in Asian cooking.

Linda Quo has conducted her own cooking institute and written 7 recipe books.

Make a point of coming along tomorrow and learn about cooking techniques and recipes of Japan.

See also a film titled "Journey Through Japan."

State Energy Commission Theatre
11th Floor, 365 Wellington Street, Perth.
(just east of Barrack Street)

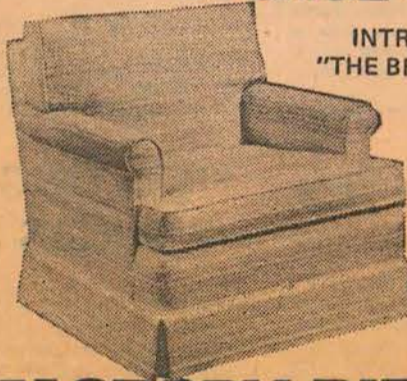
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Deferment on bauxite sought

The Australian Conservation Foundation yesterday called on the WA Government to defer legislation to expand bauxite mining until an assessment of the project's environmental impact had been concluded.

The director, Dr J. G. Mosley, said in Melbourne that the ACF had written to the Premier, Sir Charles Court, asking for action on the proposed legislation to be suspended until after the environmental reports had been published for public comment.

It had also asked Sir Charles to announce that he would agree to a public inquiry if there was still disquiet about the project after the report was published.

Dr Mosley said that the great haste in which the legislation was being pushed through and the lack of any procedure for public participation were sure signs that the companies and the Government had a poor case.

An environmental review and management plan—WA's version of an environmental impact statement—would be completed after the decision had been made on the proposal.

This would not necessarily be made public and would be concerned only with the conditions to be applied.

NATIONAL ISSUE

Reports from WA councillors to the ACF's last meeting indicated that the bauxite mining proposal was a national issue.

Information available to the ACF suggested that the Government was prepared to jeopardise Perth's future water-supply system to bolster its development image.

It was pertinent to ask how far the Government was prepared to go in risking the long-term stability of the WA environment for short-term gain.

The area of Alcoa's proposed mining expansion was the main source of water for the metropolitan region.

CSIRO research indicated that the combined effect of mining and dieback disease would increase salinity in the reservoirs to well above acceptable levels laid down by the World Health Organisation.

JARRAH THREAT

By spreading dieback and creating conditions in which reforestation was hazardous, expansion of bauxite mining threatened to reduce to remnants the world's only jarrah forest.

WA, a State poorly endowed with forest, could ill afford to lose such a valuable source of timber, recreation and catchment-area protection.

Dr Mosley said the onus should be on the bauxite mining companies—Alcoa and Alwest—to show that their projects would bring some net benefit to the community.

This would force the miners to provide information on why bauxite could not be obtained from areas other than the world's only jarrah forest.

Other major matters for consideration included the loss of jobs in the forests directly affected by mining and in the timber industry generally.

PM orders full inquiry

FROM PAGE 1

The judicial inquiry was approved at a dinner at The Lodge to which Mr Fraser summoned senior ministers on Sunday night.

It was attended by the Deputy Prime Minister, Mr Anthony, the Minister for Administrative Services, Senator Withers, Senator Durack, and the Transport Minister, Mr Nixon.

Mr Robinson also attended and took part in the discussion.

Mr Fraser, who is touring Aboriginal settlements in the Northern Territory, told his press conference last night that there were precedents for a minister's being relieved of his duties while allegations were investigated.

Members of the Prime Minister's staff in Canberra last night produced details of cases in 1943 and 1949, when Labor was in office.

In each case Mr E. J. Ward, a minister in the Labor Government, was relieved of his duties while a royal commission conducted an inquiry.

In the 1943 case the then Prime Minister, Mr Curtin, said: "As the inquiry of the royal commission will affect the position of a minister in my Cabinet, I have adopted the normal procedure of relieving him of his administrative duties until such time as the report of the royal commission is tabled in Parliament."

TERMS

The royal commission terms of reference require Mr Justice McGregor to investigate whether any action by Mr Robinson caused any breach of the law or any impropriety during last year's Federal redistribution in Queensland.

Mr Fraser sacked Mr Cameron as Deputy Government Whip last month.

In his parliamentary statement on April 7, Mr Cameron alleged that at a lunch in Beaudesert

last year Mr Robinson had given 11 people advance information on the redistribution.

He said the lunch was on July 26, and the commissioners' redistribution proposals were not published till August 10.

Mr Cameron read from what he said was a statutory declaration signed by four of the people who were at the Beaudesert lunch.

In yesterday's letter to Mr Fraser, Mr Robinson repeated the denials he has made in Parliament of Mr Cameron's allegations.

He said he was incredulous that, having given personal assurances to Mr Fraser and to the Parliament, he should be seen to be in the position where he must justify or prove his innocence.

TRIPS CANCELLED

Because of the report recommending an inquiry, it was decided that Mr Robinson should not go overseas to attend meetings of the Asian Development Bank in Vienna and the International Monetary Fund in Mexico City.

Mr Robinson could not be reached last night, but a member of his staff said: "Whatever the Minister has to say will come out at the inquiry."

Mr Cameron also could not be reached.

Mr Hayden said that the Government's decision to hold the judicial inquiry was correct, but long overdue.

School threat

FROM PAGE 1

The principals had to budget closely. They had to worry about overspending if they had to hire a relief teacher to stand in for a staff member who was sick for a long time.

This was the sort of issue the union wanted to be consulted on before policy was decided.

The Opposition spokesman on education, Mr R. Hetherington, said last night that he was glad Mr Jones appeared to be adopting a more conciliatory attitude.

His attitude in the past had been to leave little room for consultation. This was shown in the way he introduced changes in pre-primary education, Mr Hetherington said.

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ALSO

See over page

NATIONAL

THE EUROPEAN



"Don't call us, we might call you—and that's a promise!"

Forestry methods are criticised

C. W. MOORE, Dwellingup: I have recently retired as a shire councillor after having served the people of Dwellingup for six years.

It is with frustration that I read letters regarding all facets of bauxite mining and water catchment from people who, by their inaccurate quotes, show they have no practical experience of the problem. Some seem intent only on quoting from Forest Focus, which is the public-relations mouthpiece for the Forests Department.

The facts of how dieback has been spread over the past 60 years (remembering bauxite mining has been in this area only five years) by the timber industry hardly seem to rate a mention.

If we take Dwellingup forestry division as an example, the timber industry will take every millable log over an area in excess of 20 times the area Alcoa will mine in a given year. It is a fact that if dieback is present it will be spread throughout these logged areas.

REPLANTING

The Forests Department's record in replanting logged and dieback-infested areas is nothing less than scandalous.

Figures given to the Murray Shire Council show that in the last financial year nearly 2500 hectares was logged yet only about 16 hectares was replanted.

There is a complete difference in Alcoa's operation since every hectare mined is replanted, and of late an understory is also established.

There is a general consensus of practical people from within the timber industry in Dwellingup that if the present practice of forestry is allowed to continue, the only areas of live forests to be found will be those planted on mined bauxite areas.

Another factor that must be remembered is that jarrah is so susceptible to dieback, and is so slow-growing, that the Forests Department has not and probably could never justify replanting the species for commercial use.

A visit to trial plantings at Dwellingup of jarrah would show readers why this is a true but sad fact.

I suggest to readers that they find out all the facts before they mouth off on a subject which could greatly affect the lives of Dwellingup residents.

A water resource

E. A. RILEY, Collie: The public has been constantly reassured that Alcoa's bauxite-mining activities in the Darling Range will have virtually no effect on our water catchment areas.

A very intricate creek system surrounds the proposed refinery site at Worsley, the biggest being the Hamilton River which is responsible for vast amounts of fresh water feeding into the Wellington Weir.

No doubt the shandyng effect this fresh water has on the salty Wellington Weir is of great importance and benefit to the State.

I am familiar with this area, having fished these creeks for the past 30 years. There is no doubt in my mind this creek system will suffer when the refinery is built.

I can visualise great chimney stacks belching impure particles and poisons into this system.

Can we afford the risk and indeed the inevitable consequences of more clearing and pollution of our dwindling natural forest and water resources?

Storm help by prisoners

Mrs VALARIE LESTER, Girrawheen: I wish to thank all the prisoners for the voluntary assistance given to the people of the South-West after the storm damage from cyclone Alby. They assisted in an honorary capacity, and I thank them for not breaking the trust given them.

VICEREGAL

The Governor, Sir Wallace Kyle, and Lady Kyle will attend the dawn service at the State war memorial at 5.58am today and the wreath-laying ceremony at the Jewish war memorial at 6.10am. They will attend the Anzac Day main service and parade in Riverside Drive at 11am.

LETTERS to The Editor

VARIATIONS IN PUNISHMENT

B. J. WALLIS, Morley: Periodically one reads of sentences being imposed, often by the same magistrate or judge, for similar offences and there seems to be little consistency in the penalties.

I accept that a variety of circumstances exist which influence the decision, but I think the decision-maker must have doubts as to the right decision.

The problem seems to be that although there are maximum penalties there seems to be no minimum penalty and often, with the aid of a clever lawyer, an offender gets off almost scot-free for an offence that to me, as a layman, requires a more severe penalty.

Perhaps some legal professional would care to explain and offer comment on why there is no minimum penalty.

The Attorney-General, Mr Medcalf, said: Opinions will frequently differ as to the severity or lightness of a particular sentence. The facts of two cases are rarely the same. If Parliament were to fix a minimum penalty in all circumstances it would be pre-judging every case. Some Acts do prescribe minimum penalties but they are not favoured because they take away the court's discretion. The crown now has a right of appeal which it can exercise if it considers that the judge's discretion has miscarried.

Prisoners and the law

Sir—In reference to your editorial "Prison report" (April 8) we remind you that the circumstances which led to the New South Wales royal commission on prisons were a culmination of an authoritarian administrative decision to place all persons housed in prisons outside the protection of the rule of law.

We submit that the abhorrent brutality handed out to prisoners by prison warders in NSW would not have occurred if the legislature, executive and judiciary had not given a tacit approval for these practices in withholding protection of the law to prisoners.

In this regard WA does not have a good record, especially in relation to the treatment of mental patients. At present they are punished as convicted criminals even after having been found not criminally responsible according to law, and they are also subject to arbitrary indeterminate imprisonment at the Government's pleasure regardless of expert professional recommendations to the contrary.

It is to be hoped that the rule of law will eventually take precedence over political and administrative fiat.

P. R. WILSMORE, Fremantle and BRIAN G. TENNANT, Subiaco.

HELPING THE MENTALLY ILL

M. KYD, South Perth: As a trained psychiatric nurse, I strongly sympathise with Professor G. Allen German's view ("The rights of the mentally depressed," April 5) regarding the mentally ill and their need for care and help. In particular he highlights the distress which depressed people may experience.

As someone who himself has experienced depression, I appreciate his attitude of concern.

The results of conventional treatments I received, which included drugs and insulin coma treatment, were: My

physical, mental and emotional states were detrimentally affected through overweight (my whole metabolism was disrupted), I had diminished ability to concentrate on tasks, I lost natural drive and ambition, and my emotions were dulled. In short, depression was aggravated artificially, and not ameliorated.

Since then, I learnt to overcome depression through a form of therapy which helped me to experience and express my feelings rather than have my emotions depressed through drugs

Bibbilum track

R. VAN DELFT, Brentwood: I propose that Norm, our sports-loving hero, take up bushwalking to celebrate Western Australia's 150th anniversary.

But where can he walk to? The Bibbilum track? Perhaps it can be arranged for the track to be officially opened and for a party to walk the first 150km—a kilometre for every year of our State's progress.

I feel sure that a number of people (including myself) are interested in walking this distance of the track. I believe that it can be opened in time since the Forests Department has been working on the project for years, marking and mapping the track. However, it is at present waiting for the outcome of the System Six report.

If this walk is successful, Norm might get fit, appreciate nature and join those who say: Bushwalking. Be in it.

PICKETING CHARGES

BERNARD A. WRIGHT, South Perth: One can understand the abusive tone of Messrs R. Hawke and P. Cook towards our Premier, Sir Charles Court (reported April 21), for it is obvious that the Premier is determined that the course of justice shall not be perverted by union bully tactics.

The denigrating tone of Messrs Hawke and Cook serves notice to us all that they themselves recognise the very weak ground they are on in demanding that the charges against the picketers should be dropped.

or shock treatment. I believe I have been fortunate and now know I need never again fear depression.

I respect Professor German's wishes, if he should be unfortunate enough to suffer a severe depressive illness, to be given compulsory treatment of the kind his fellow psychiatrists decide is appropriate.

However, I would urge that consideration be given to the need to tell patients of the many choices open to them and to the fact that other people would prefer a choice.

Special Advertisements

DENTAL Surgery/Simon Rackleft B.D.Sc. will be opening a new dental surgery this Saturday at Carline Medical Centre, 14 Davillia-rd Duncairn. Appts may be made on 4472513.

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Alcoa and rehabilitation

A number of correspondents have debated the expansion of bauxite mining through the columns of your newspaper.

While many of the letters have contained reasoned criticism, others have indicated a lack of knowledge and unwitting distortion of the issues.

In the interests of an accurate and rational debate, the following information may bring your correspondents up to date.

• The ratio of land affected by dieback as a result of mining activities is a figure that has been subject to a great deal of misunderstanding.

The figure of three hectares infected to every hectare mined was an estimate of the Forests Department at the time the CSIRO mathematical model was being developed.

The model assumed a theoretical case where mining alone introduced the spread of dieback throughout a relatively uninfected catchment. It also made the unrealistic assumption that all mining for Pinjarra would take place in the South Dandalup catchment till bauxite in that catchment was exhausted.

Ratio

As the Minister for Forests, Mrs Craig, stated recently in a letter to *The West Australian*: "The ratio of three hectares of spread of dieback to one hectare of mining has no validity in forest that is already riddled by dieback, and much of the bauxite mining that will be done for at least the next 20 years by Alcoa will be in dieback-infested forest."

A letter to the editor from Mr C. J. Agnew, mines manager for Alcoa of Australia Ltd.

In addition, the magnitude of the dieback problem is shown clearly in the 1977 annual report of the Forests Department. It states that 194,000 hectares of State forest was known to be infected by dieback.

The department says that a further 156,000 hectares may not be protectable from the disease. If that is so, 17.5 per cent of State forest could succumb to the disease even if further infection could be prevented in protectable forest.

In the light of these figures, mining activities in the present and foreseeable future would not have a major effect on the overall rate of the spread of dieback.

Thriving

• A lot has been written about the ability of trees to grow on rehabilitated mine sites. Since Alcoa began mining bauxite in the Darling Range in 1962 more than 700,000 trees have been planted on former mine sites. The fact that trees are thriving after 12 years in spite of the worst three-year drought ever experienced in this part of Western Australia and the recent cyclonic winds, attests to their hardiness.

Over that 12-year period, Alcoa and the Forests Department have worked in close co-operation to determine species most suitable for this climate and environment, and the most appropriate rehabilitation techniques.

The programme has not been without its problems. In 1966 there was some windthrow, particu-

larly of coastal pines (*Pinus pinaster*) planted at Jarrahdale.

However, the site had not been subject to cultivation by deep ripping, which is now employed by Alcoa to loosen up the subsoil and improve root penetration. In addition, about 0.5 per cent of the tallow wood (*E. microcorys*) planted has died as a result of drought stress combined with insect damage.

The fact that there are other species more tolerant to dry conditions was recognised by the Forests Department, which has not planted tallow wood on former bauxite mine sites. It has also recognised the fact in its own dieback rehabilitation sites since 1972.

• In the most recent detailed studies of root systems, all of the nine eucalypt species so far examined showed the ability to send their roots below the depth of ripping. They include Tasmanian blue gum, red mahogany, marri, wandoo, Sydney blue gum, spotted gum, butter bark and powder bark wandoo.

The original root studies referred to by your correspondents were preliminary and, in retrospect, appear to reflect the great difficulties of sampling in tree-root studies, rather than the absence of penetrating roots.

Techniques

• Rehabilitation techniques used on former bauxite mine sites have been developed rapidly over the past 12 years in conjunction with the Forests Department.

There are no "massive" doses of fertiliser given to trees which, when withdrawn, will mean their end. Rather, the mine pits are reshaped to blend with the sur-

rounding landscape, erosion control structures are established and the topsoil is returned.

The clay subsoil is then ripped to a depth of two metres to assist root penetration and eucalypt trees are planted. Each tree is given a total of 200 grams of fertiliser in two doses, the first at three weeks and the second at nine weeks.

Seed from wildflowers and shrubs native to the Jarrahdale forest is then applied to add to the undergrowth regeneration from seed in the topsoil.

• Since mining began in 1962, Alcoa has cleared a total of 1985 hectares for bauxite mining. This is about 0.1 per cent of the total State forest.

The current rate of bauxite production means that about 270 hectares of forest is cleared for mining activities and subsequent rehabilitation each year.

If the operation was permitted to proceed to its optimum potential around the year 2000, the figure could rise to a maximum of 750 hectares a year. The figures quoted refer to areas cleared for mining and include areas for haul roads, conveyor belts, workshops and offices, as well as mine pits.

Restoration

All land cleared for mining is rehabilitated. However, because of the seasonal nature of clearing and the base-load areas for associated facilities, there is no constant relationship between the area cleared in any one year and the areas mined.

• In order to help overcome the effect of dieback, Alcoa is prepared to rehabilitate dieback-infected forest in areas immediately surrounding those cleared for mining —irrespective of whether the dieback was there as a result of natural spread or human activities that may have taken place before mining began.

Alcoa is proud of its operations and we believe that people would have a more enlightened picture of what is being done if they saw the rehabilitation programme at first hand.

Obviously, it may take some time to arrange visits for everybody, but we would welcome the opportunity to put our case in this way to people who obviously take a great deal of interest in bauxite mining and rehabilitation.

'Dismay' on Bill for Hills mining

J. WILLIAMSON, chairman, WA division, Institute of Foresters of Australia: Last month, in the debate on bauxite mining in the jarrah forest, the public was assured that: "When the details are announced it will be seen that all the interests of the people of this State have been safeguarded. Parliament and the people will then have ample time to comment on what is proposed." (Sir Charles Court, Letters, March 11).

Last December we learnt that Alcoa was preparing an environmental statement in connection with the Wagerup refinery proposals and that the statement would be made public.

The WA division of the Institute of Foresters has refrained from entering the recent debate till now in the belief that after 15 years of bauxite mining there would at last be a comprehensive statement and an assessment of the effect of mining on the jarrah forest ecosystem. This, we hoped, would provide a rational basis for further discussion before decisions on expansion would be made.

REVIEW

The announcement (reported April 19) that legislation to provide for new refineries at Wagerup and Alwest would be introduced into Parliament before comprehensive environmental review and management plans (ERMP) were available, was viewed with dismay.

There could now be as little as one week for Parliament and the public to consider this important issue. And then it will be in the absence of enough information, in the form of ERMPs, on which to base rational decisions.

These issues are complex as indicated by the fact that the company has not been able to provide an ERMP in the extended period between announcement of the Wagerup refinery proposal last year and the presentation of the Bill in Parliament.

We consider that it is essential that the public and those who will vote in Parliament on this Bill be given at least three months to consider

the issues involved, after the publication of the relevant ERMPs.

Pine salvage race begins

The Forests Department is recovering 1000 tonnes of timber a day from the wind-damaged Grimwade pine plantation near Kirup in the South-West.

The department hopes to boost the daily recovery rate to at least 1400 tonnes within the next few days.

The Minister for Forests, Mrs Craig, said that the salvage operation was being concentrated initially at Grimwade to achieve maximum recovery.

Work would begin in the Bussells plantation near Collie and in other areas as soon as possible.

URGENT

The salvage operation was urgent because most of the trees had been snapped off and were likely to develop a fungal stain within weeks.

The director of the Department of Woods and Forests in South Australia, Mr Peter South, had been brought to WA to advise in the salvage operation because of his extensive experience in the use of pine timber.

The WA Conservator of

Forests, Mr Bruce Beggs, had considered that Mr South's knowledge and experience would be invaluable in the race to save as much as possible from the eight square kilometres battered by the fierce winds from cyclone Alby, Mrs Craig said.

It was not possible to save all the fallen timber immediately or to use the smaller material.

All possible methods of salvage, preservation and use of the timber were under urgent and continuous study.

Top priority was being given to salvaging and treating saw logs.

Rehabilitation of the plantations and the reuse of sections that had been flattened was receiving attention.

The CSIRO division of forest research in Canberra would also send an officer to WA to evaluate the situation and to study blue-stain fungus.

Future of forest

J. OLDHAM, Swanbourne: The letter from the Minister for Forests, Mrs Craig, is far from reassuring about the future of our jarrah forest.

The way bauxite mining is justified because it is taking place in dieback-affected areas is disgusting.

If a patient is suffering from cancer we do not savagely attack the infected part of his body so as to rapidly spread the disease. We know this would be fatal.

Instead of mining the dieback-infected areas, we should be concentrating our remedial measures at just these critical points.

It is wholly concerned with the rate at which we will destroy our jarrah forest and not at all with its protection.

The terms she uses in reference to dieback fill me with dismay.

She says all mining in the next 20 years will take place in forests riddled with dieback.

M. J. Cook (Letters, March 31) points out that an area being cleared for mining at Dalpark, north-west of Dwellingup, is some of the best pole-stand jarrah anywhere in the State and little affected by dieback.

Mining for bauxite

D. H. PERRY, Victoria Park: Sir Charles Court (Letters March 28) adds little to the debate by impugning my honesty and accusing me of using innuendo and smear. Might I suggest to our Premier that he reads a little further than the end of his quote in Hansard where he will find the following:

"I stress these acreages because I think it has been conveyed in the public mind that large areas will be involved all the time and we will have ugly scars all over the place from one end of the State to the other."

Surely this was an attempt by Sir Charles to reassure Parliament and the public that 30 acres a year was not a big area of forest to sacrifice to this industry. This is certainly the interpretation put on it by foresters at that time.

WATER HOPE 'OPTIMISTIC'

F. EGERTON LEFROY, South Perth: The general manager of the Metropolitan Water Board, Mr Frank Armstrong, was reported (April 1) as saying that normal rainfall this winter would cause the dam catchment next spring to be 240 million cubic metres; that is up 70 million cubic metres on last November. This may well be too optimistic.

My figures relate to the water year, beginning and ending on June 30. But they are probably not very different from those of early November which were quoted by the MWB general manager.

In the past 12 years, the rainfall in six was above average, in six below average. In only one of those years did the increase in storage exceed 70 million cubic metres, in 1973-4.

In the six wet years the average annual increase in storage was 30 million cubic metres, while in the six dry years the average annual decrease in storage was 45 million cubic metres. The difference in these two figures shows clearly that the decrease in a dry year exceeds the increase in a wet year—a fact which many would hold was predictable.

For the MWB forecast to hold it will be necessary for a considerable part of the recently-induced consumer frugality to continue over the winter months.

Expert tells of search for water

The coastal region between Geraldton and Augusta was WA's greatest potential source of drinking water, an expert said yesterday.

Mr E. D. O'Driscoll, chief hydrologist with the WA Mines Department, said that this resource would have to be developed and managed in the future.

He was speaking at the 58th annual conference of the WA Co-operative Federation.

He said that since 1960 the Government had investigated 49 possible dam sites from Wyndham to Denmark.

Twenty-five sites had been examined in detail and six dams had been built.

Few suitable dam sites were left in the Darling Range and no reasonably attractive sites were known between Perth and the Fortescue.

There were several usable dam sites in the Pilbara but none had been developed because of the proving of big reserves of underground water which were usually cheaper and could be developed more quickly.

FORTUNATE

WA was fortunate in having fairly big groundwater reserves.

"Valuable groundwater supplies underlie Perth and other areas of the coastal plain," Mr O'Driscoll said.

"Since 1962 the Government has drilled extensively to investigate them.

"The water-bearing beds vary greatly in nature and in thickness and not all the water they contain can be extracted by pumping.

"But they underlie huge areas and contain large volumes of drinkable water.

"North of Perth the shallow water through-flow is 150 million cubic metres annually and the stored volume 13,000 million cubic metres.

"South of Perth the figures are 65 million and 5000 million cubic metres respectively.

Mr O'Driscoll said drinkable water in the Pilbara was mostly along the river valleys and drainage lines.

When recharged annually by cyclonic rain, it could probably provide 120 million cubic metres a year, including 20 million from Millstream.

Added to this was about 100 million cubic metres a year underflow in the Canning Basin.

Using our resources for living

R. H. GORDON, Bod-
dington: One can't help
admiring the sheer gall
of environmental pro-
testers living in Perth
(where most of them do
seem to live).

While not in any way
decrying the rightness of
their protests, it is sure-
ly a classical case of the
pot calling the kettle
black.

They are sitting com-
fortably on a ruined en-
vironment. They have
polluted the river—des-
pite official gobbledegook
to the contrary—to a
point where it is no
longer recognisable as
the same stretch of clean
water it was 50 years
ago—I know this for a
fact, since I used to swim
off an old jetty in South
Perth when I was a lad.

They are busily engaged
in polluting it further,
and filling it in to make
more room for more
cars. All that is left of
the original bush is a des-
ecrated Kings "Park".
They have steadily des-
troyed the environment
as far east and south as
Armadale.

These are the people
who have the hide and
audacity to bellow about
us bush-whackers up-
setting the ecology.

Secure from the ele-
ments in the concrete
and bitumen jungle, peo-
ple like Mr John Oldham
(Letters, March 29) are
given space to express
the easy, emotive, argu-
ments that have so much
appeal to those who have
never been east of the
Causeway.

How do they think they
have acquired this secur-
ity? By the rape and
plunder of our natural
resources, of course.
However, they now take
the attitude that as they
are nicely fixed up, thank
you, absolutely no fur-
ther damage should be
done: the outside world
must be preserved for
them as some sort of
magnificent playground
—for those that do, in
fact, venture east of the
metropolitan area.

I'm afraid it's not go-
ing to work out that way.

Hancock broadside stuns NCP

By John Arthur

The National Country Party was shaken today when mining magnate Mr Lang Hancock attacked its president, Mr Jim Fletcher.

Mr Hancock—said to be backing the party with \$250,000 over two years rapped Mr Fletcher's view on bauxite mining.

Mr Hancock said in a six-page statement that he "sincerely hoped" funds recently obtained by the NCP "will not be used to stop mining in any form."

Mr Hancock said the No. 1 enemy of civilisation was the restriction on progress by environmentalist movements.

But Mr Fletcher today reaffirmed his belief that bauxite mining should not be expanded until further studies were completed.

He said the NCP committee looking at the bauxite policy would come to a similar conclusion.

Mr Fletcher reacted sharply to being linked

with what Mr Hancock called 'eco nuts.'

He said the NCP intended to perform as a better party with the help of its new financial backing.

This included upgrading its policy on looking after the environment.

He said the party would not bend.

"We are not interested in anybody's money having any affect on us," he said.

"Many people subscribe to political parties and they don't always perform as they wish—but they support the party's general platform and policies."

Mr Hancock's attack on Mr Fletcher is seen as particularly significant, as Mr Fletcher led the move to completely alter the NCP image and administration earlier this year.

Mining Industry seminar

COUNCIL'S NATIONAL PARKS PLEA Environment laws 'stop growth'

CANBERRA: The Australian Mining Industry Council wants national parks opened to exploration and mining.

This was part of the council's new policy, a vice-chairman, Mr D. F. O'Driscoll, revealed at a seminar yesterday on "access to minerals and security of tenure."

Mr O'Driscoll, chairman of Jododrex Ltd, said that the council was urging multiple use of national parks and public reserves.

And it was opposed to the concept of preserved wilderness areas, especially huge areas, proposed by the Australian Conservation Council.

Mr O'Driscoll said that there was no chance of getting approval for mining and exploration in national parks unless appropriate restrictions were also proposed.

"Furthermore, the res-

trictions proposed should, as far as possible, be written into legislation so that political intervention is avoided," he said.

"The council aims at ensuring that ad hoc decision-making with regard to the establishment of national parks gives way to soundly based land-use planning procedures."

Conflicts over particular areas would no doubt still arise, but planning would provide a rational basis for their resolution.

Proper planning would ensure that decisions did not inadvertently close off foreseeable productive options for land use.

"However, the best we can hope for, or indeed reasonably ask for in the case of national parks, is

to be given the right to put a case for exploration and, if a mineral discovery is made, the right to put a case for development," he said.

Access to minerals was declining in Australia and the industry should be prepared for a continued programme aimed at educating the community on all aspects of mineral activity, he said.

Mr O'Driscoll urged legislation to ensure the highest practicable standards of environment protection.

The industry was usually seen to be opposing environmental legislation, he said. It got little credit for the fact that its criticism was generally constructive and based on matters of detail.

Environment laws 'stop growth'

Australia's basis for growth was being inhibited by environmental controls, a Queensland mining industry leader told the seminar.

The Queensland Chamber of Mines president, Mr D. T. Buchanan, said that unrestrained growth—with damaging results—could appear in many forms.

"During the last few years, for instance, we have seen the steady growth of environmental legislation and administrative procedures at both Federal and State levels," he said.

"If left uncontrolled, this growth possesses the potential to suffocate mining development and, for that matter, other development.

"I believe that this potential danger has crept up on us without our fully realising its retarding effect.

"It is now too serious a matter to be considered as merely a good subject for polarised public argument."

Mr Buchanan said he did not argue against the need for government action in environmental areas.

Australians were very fortunate to be able to take time to consider such matters.

'BALANCE'

"But concern for the environment is a matter of balance—balance between continued economic development to ensure that our standard of living is maintained and hopefully improved and environmental protection," he said.

"Unhappily for us, the mining industry more than any other industry—is having to endure a giddy ride on the see-saw while the point of balance between development and environmental protection is being sought."

The mining industry had the dubious distinction of being the only industry to suffer the selective application of export controls for environmental reasons.

Objectively, it was hard to see why the industry should have been selected as the main environmental battleground.

Miners disturbed less than .0035 per cent of Australia's land surface—far less than roads, real estate and other areas of development.

'HARD WAY'

"We possess great environmental expertise, learnt the hard way, by coping with and understanding a wide range of environments in developing our projects—more often than not in harsh, remote locations," he said.

"We achieved much in environmental protection and rehabilitation long before ecology and other catchcries found their way into trendy vocabularies.

"It has been calculated that by 1979 the mining industry in Australia will have spent more than \$410 million on environmental protection measures over a 20-year period."

Super-tax 'unwise'

A resources super-tax would hit at the miners' hopes of striking it rich, the council president, Sir James McNeill, said.

The council believed that such a tax would not best serve the national interest.

Such taxes would constitute an abandonment of the principles of tax neutrality between the various sectors of the economy.

The mining industry could not accept that there were valid grounds for singling it out from all other sectors.

"It is not as though mining in general is spectacularly profitable in relation to other industries," he said.

Inconsistency in bauxite figures

N. SEGAL, West Perth: Figures given for bauxite production and areas mined are variable and inconsistent. Paramount are the figures given for the extent of the area that has been and will be cleared for mining.

Among the figures discussed in recent letters to the editor are 407 hectares, 700 hectares, 1221 hectares and 1500 hectares. The first three are from government sources and the fourth is based on government data.

The source for the 1221-hectare figure that I gave in my letter of March 16 is a "report... prepared as a thought starter for the... conference between the company (Alcoa) and State officers on April 14, 1977." The figure appears in Section 3, "Basic Information," which I quote in its entirety in the table below.

The Minister for Forests, Mrs Craig, declares obsolete (Letters, March 27) the mining-to-clearing ratio presented in Forest Focus No. 4.

So too is the 407 hectare figure — as she must well know, because on October 27 she presented the much bigger figure "approximately 700 hectares per annum" in reply to the question in Parliament, "How many hectares of land will Alcoa Ltd mine for bauxite in the Darling scarp each year when its proposed expanded mining operation reaches full production?"

Using only the minister's figure of 700 hectares to be mined each year plus the 300 hectare figure for Alwest that she did not dispute, and applying her revised ratio of 400/700 for mined to cleared land, we must still regard 1500 hectares as a conservative, not even a maximum, estimate of jar-

rah forest to be cleared annually by the bauxite mining companies in the year 2000, unless they are constrained by strict legislative controls.

No one will dispute that the western zone of the Darling Range jarrah forest is severely infected by dieback disease, but there is disagreement as to the extent of the infestation. Large enclaves of healthy jarrah still exist there and should be protected.

There are also extensive areas, especially along watercourses and in valleys, where dieback has struck down the jarrah but has left beautiful forests of marri, blackbutt and wandoo with varied and often lush understories.

Though the jarrah trees remain only as skeletons these stands are still valuable, complex, scenic elements of the jarrah forest ecosystem and should be preserved, free of mining, mine roads, conveyor belts and other associated clearing.

Rather than directing its efforts towards passing unpopular legislation to expand bauxite mining the Government would be better advised to concentrate on providing strong environmental safeguards and restrictions on the locations of mines (preferably locating them all away from State forests).

More than mere assurances from the Premier and his Minister of Forests are needed. After all, they will have retired or been voted out of office long before the full effects of the destruction of the jarrah forest are felt.

"Statistics of the projects supplied by Alcoa are as follows—

	1975	1976
Bauxite production, million tonnes	8.0	n.a.
Alumina production, million tonnes	2.23	3.11
Area mined, hectares	227	n.a.

Assuming a 7 per cent growth rate in alumina production, relevant statistics in 2000 would be as follows—

Bauxite production, million tonnes	43
Alumina production, million tonnes	12.0
Area mined, hectares	1221

The cumulative area mined would be 15,400 hectares (60 square miles) and cumulative production of bauxite around 500 million tonnes. Expansion to the above extent could be constrained by the available reserves of bauxite or other factors."

Information on forest

BARBARA C. CHURCHWARD, general secretary, Tree Society: The non-political Tree Society takes issue with Dr B. O'Brien (Letters, March 11) for his comments on bauxite mining.

Information "available to the public" is relatively inaccessible, a fact known to Dr O'Brien. The voluntary conservation movement, at its own expense, attempts to keep pace with this information, which often receives little more than lip service from the Government.

In the case of bauxite mining in the Darling Range, is it any wonder that people talk about a fight between Goliath and David?

It is a battle between big business and the Government on the one hand—and they have everything to gain in the short term and hold practically all the cards—and the conservationists on the other, who stand to gain nothing but the conserving of the only jarrah forest in the world.

A.L.P. considers bauxite future

The WA Opposition is making an exhaustive study of all aspects of bauxite mining in WA.

The examination is being carried out by the party's industrial development, forests, mining and conservation, and environment committees. They aim to ensure that the ALP is fully informed before the Government introduces legis-

lation to amend the Alcoa and Alwest agreements to provide for the development of new alumina refineries at Wagerup and Worsley.

The study began about three weeks ago. A report is expected to go before the caucus in about five weeks. It is also expected to be made available to the ALP State executive.

The committees have already had talks with CSIRO and Forestry Department officers.

Committee members have also inspected the existing alumina refineries at Kwinana and Pinjarra, the Wagerup and Worsley sites, mining and reforestation work at Jarrahdale and bauxite deposits at Mt Saddleback.

They will have more briefings soon from the Department of Industrial Development, the Hunt committee—which is monitoring bauxite mining—water supply officers and representatives of Alcoa and Alwest.

Talks will also be arranged with community conservation groups.

UNUSUAL

An unusual aspect of the briefings is that the Minister for Industrial Development, Mr Mensaros, has indicated that he will take part in briefings by his officers.

The spokesman for the committees, Mr H. D. Evans, said yesterday that the ALP would seek information on the economic significance of the industry, the total investment, royalties and job opportunities.

The group had already been given details of research by the CSIRO and the Forestry Department on the effects of bauxite mining on water salinity and dieback disease.

There had been several hours of talks with Alcoa representatives, especially on environmental aspects of mining.

Mr Evans said that the study was probably the most comprehensive undertaken by any political party for years.

Purity of city water defended

Perth people would continue to get an adequate supply of pure water, the chairman of the Metropolitan Water Board, Mr A. M. Batty, said yesterday.

He dismissed claims that the city's water supplies were already seriously polluted.

Mr Batty was replying to a statement by the secretary of the Water Supply Union, Mr Gordon Bennett, on Sunday that mining and logging in the board's catchment areas were already causing serious pollution in Perth's water supplies.

He said that the board was vitally concerned at any activity in its catchment area and was continually monitoring effects.

Mr Batty said Mr Bennett appeared to have quoted several isolated examples that did not give an accurate picture of the water in the board's storages.

Salinity

Although much had been said about salinity, experts reported that it was not increasing in Perth's water supplies as a result of bauxite mining in the Darling Range.

It was not expected to increase while mining continued in the wetter western section of the range. These expectations were backed by scientific knowledge.

Mr Batty said that Mr Bennett had quoted a figure of five Jackson turbidity units as the maximum limit for domestic water supplies.

"What Mr Bennett did not say—or did not realise—is that this figure is for water coming out of a treatment plant," he said.

"For water from untreated sources, which is the classification in which the board's sources fall, the recommended limit is 25 units.

"In fact, in the case of water drawn from the Wungong River, the board ceases taking water when turbidity exceeds 15 units."

Turbidity

Mr Batty said that high turbidity above the Wungong dam was natural because the water basin had just been cleared and the contractor was building an earth dam. Both operations caused considerable disturbance.

This would be rectified when water was stored and settlement had taken place.

Draw-off from any new reservoir was allowed only when the water was acceptable for domestic use.

Mr Batty said that the board was not aware of any unusual problem in the area east of Canning dam.

Catchments in this area were managed by Forests Department foresters to the board's strict requirements.

Every effort was made to anticipate and remedy problems.

LOGGING

Logging near the Canning dam was carried out under a special prescription based on experience near the Serpentine dam in 1976.

The Canning prescription involved the retention of a 20 per cent canopy cover.

In no case had the area been logged for coppice, small poles and saplings.

Buffer belts between 100 and 300 metres wide, depending on the topography around the reservoir, had to be retained in an unburnt condition for two years after logging to provide a filtration bed.

Mr Batty said he had been advised that the Forests Department was aware of some concern at the officer level during the Canning logging.

But detailed field inspections and water sampling had indicated that the concern could not be directly attributed to logging.