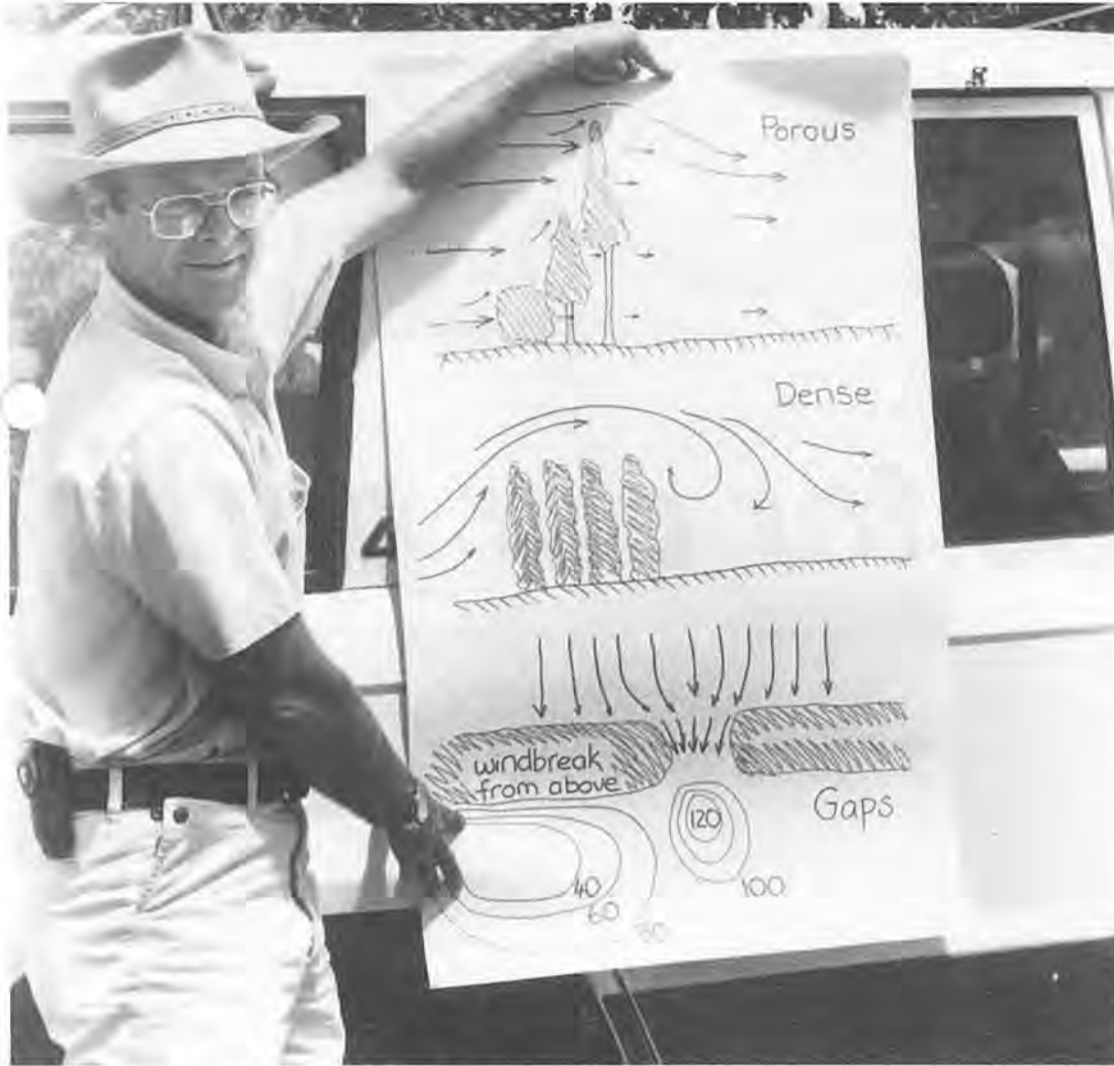


CALM NEWS

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

COMO RESOURCE CENTRE
DEPARTMENT OF CONSERVATION
& LAND MANAGEMENT
WESTERN AUSTRALIA

May 1991



David Bicknell uses a wind flow diagram during one of his talks on the Trees on Farms project. Photo courtesy The Countryman.

Campaign against dieback

Fighting dieback has become one of CALM's most urgent missions.

The Department has begun a new campaign against the disease - *Fight Dieback. Give Our Plants A Chance* - and joined forces with Rotary clubs between Mosman Park and Esperance to educate the public about how they can help stop the spread of dieback (*Phytophthora cinnamomi*) in natural areas.

Executive Director Dr Syd Shea said the spread of dieback in the flora-rich south west was one of the most serious conservation problems in Australia.

"It's possible that we could lose two thirds of the incredibly diverse plants that only live between Kalbarri in the north and Cape Arid in the south.

"Unless the spread of this disease is controlled, a number of endangered animals that depend on this flora will also be in jeopardy."

Dr Shea said the disease was known to attack at least 900 plant species in Western Australia and many, such as banksias and dryandras, died very quickly.

Species that have been badly affected by the disease include *banksia speciosa*, *banksia grandis*, *banksia brownii* and jarrah (*eucalyptus marginata*).

It is estimated that 13 per cent of WA's forests are infected with the disease.

Dr Shea said the Department had already had some success against dieback through an extensive program which involved research, the identification of disease-affected areas using satellite information and the latest advances in aerial photography, comprehensive hygiene management, restriction of public access to high risk areas and public information.

"Our number one strategy is to hold the fort until a practical cure or better controls for the fungus are discovered," he said.

"The public information work Rotary will be doing

is extremely important because all members of the community should be aware of the problem and how each of us can help stop the spread of this disease. CALM will work closely with Rotary on this program and is preparing a speaker's kit for club members."

Dr Shea said that while animals were implicated in the spread of the fungus which causes dieback, people were mainly responsible for the disease's spread.

The most common way in which dieback is spread is the movement of infected soil, mud or moist gravel on the wheels and underbodies of vehicles.

Prevention of this artificial spread is the greatest single step which can be taken to reduce the threat to our plants.

Dr Shea said while many people referred to "jarrah dieback", as the disease was first identified in the south west forests, there was now a much greater threat from "wildflower dieback".

CAMPAIGN LAUNCH

Environment Minister Bob Pearce and Dr Shea launched the new campaign against dieback in the South Coast Region during April.

The pair, escorted by journalists, visited dieback-affected areas of Two Peoples Bay Nature Reserve east of Albany and inspected a research plot where phosphoric acid is being used to combat the microscopic fungus which causes dieback.

The fungicide will kill

dieback, but can be difficult to apply effectively as the fungus is known to infect roots two metres below the surface. This, together with the sheer size of the area affected makes the disease almost impossible to eradicate once it becomes established.

Another technique being tested by the Department at Two Peoples Bay is the use of remote sensing to improve the accuracy of dieback mapping, essential to assess the disease risk of a particular site and to apply the necessary hygiene measures to limit the spread of the disease.

Remote sensing detects and records infra red and thermal data, as well as the visible light spectrum. Unlike aerial photography, this provides information on plant stress and cellulose levels.

Mining companies have lent their support to the Department's fight against dieback in the northern sandplains.

CALM, the Main Roads Department, Department of Mines, CRA, AMC Mineral Sands and Tiwest Joint Venture have formed the Northern Sandplains Dieback Working Party, which aims to promote the study of dieback in the area and implement effective research, management and education programs.

The formation of the working party means participants can share knowledge and experience of dieback management and pool their resources.

Funding of \$20,000 has already been contributed to the cause for the first year.

Project a success

David Bicknell, based at CALM Esperance and working on a Trees on Farms project, has returned to the Department of Agriculture.

David was seconded from the Department of Agriculture to CALM in March 1988 for a three-year term. The shift from Manjimup to Esperance to manage a Trees on Farms project was funded by the National Soil Conservation Program, CALM, the Department of Agriculture, and the Esperance Land Conservation District.

Richard Moore, research officer based in CALM Busselton, submitted the project and was the project supervisor.

According to David, revegetation on farms went through a spectacular growth between 1987 and 1990, partly due to the series of good seasons, and partly due to good farm commodity prices.

"Information on tree species, site preparation and postplanting management was not well understood by most farmers on the South Coast when the project started.

"An increase in Esperance from about 200,000 seedlings in 1987 to an estimated 750,000 in 1990, combined with a rising interest in direct seeding, pushed the resources of the Esperance CALM staff."

David said the Trees on Farms project had been mostly extension-oriented, but also managed to establish a coppicing program on mature eucalypt windbreaks, help plant a number of saltland sites for monitoring, and measure the effect of windbreaks on cropping.

Crop yield responses from windbreaks, planted on the property of Garry and Jan English at Gibson, are some of the few that have been documented in Australia. The windbreaks were established in 1984 with the advice of Klaus Tiedemann, then a CALM farm tree adviser, and now the district manager at Esperance. Tasmanian bluegum plots established by CALM in Esperance in 1989 also created a lot of interest.

"Farmers are keen to make their tree planting commercially profitable.

"Farmer interest, and the possibility of integrating woodchip production with timberbelts, has attracted some private interest in investment besides investigations being carried out by CALM."

David said that a larger trial planting established in 1990 had so far survived a dry windy winter, locusts and wingless grasshoppers, and days of temperatures in the high 40s.

Experience from the

project, work with the Esperance Land Conservation District Committee, and contact with farmers have led to David being asked to speak at many field days and seminars.

As the value of windbreaks and other revegetation technology applies to nearly all agricultural areas, David has given talks from Geraldton to Esperance, and has had an input to CALM and Department of Agriculture staff training.

David's project finished at the end of February 1991

Wood festival in September

A festival to promote scientific and artistic dialogue on the subject of wood will be staged at Curtin University of Technology in Perth from September 20-28, 1991.

Organised by Curtin and CALM, the festival, to be called *Woodworks*, will include scientific and technical exhibitions and workshops plus a series of arts-related competitions, exhibitions and other events.

A major event during *Woodworks* will be a CALM-organised symposium "Timber and Forests for Western Australians - Outlooks for the 21st

and he has now taken a position with the Department of Agriculture in Esperance for a year.

"My time in Esperance has been very rewarding, in terms of the new information about trees on farms, and especially the cooperation between two departments working in the same field," David said.

He hopes to maintain the contacts already developed and expand them in his new position as an officer with the Soil and Vegetation Branch of the Department of Agriculture.

Century".

According to Ron Kawalilak, A/Director of Corporate Relations, the festival will be designed to attract school students and the general community to the Curtin campus.

"It will demonstrate that wood and the trees and forests of WA play an important role in both the technical and artistic aspects of our lives," he said.

Australian furniture designer Helmut Leuchkenhausen and poet/novelist Thomas Shapcott are two of the major figures in the arts who will be participating in the festival.

SANKO SPILL

Four-page feature
see pages 3 - 6

Some years ago, when I was a young and impressionable public servant working on jarrah dieback, I was asked to attend a tour of dieback areas in the jarrah forest being conducted by the then Conservator of Forests, Mr Bruce Beggs, for the benefit of the members of the Standing Committee on Forestry.

I now know, but at the time did not appreciate, that Standing Committee tours provided the opportunity for the host Head of Department to show off the best of his wares. At the time, the Department was pursuing a method of "controlling" jarrah dieback called "hygiene planting".

At the appropriate point on the tour, the officer in charge of Dwellingup Research at the time, explained how this strategy was being implemented in the field and then graciously (but unwisely) asked me to comment.

I then proceeded to tell the assembled distinguished guests bluntly that I disagreed totally with this approach as it didn't recognise the fundamental biology of *Phytophthora cinnamomi*, and a few other things as well. As I completed my oration, out of the corner of my eye, I saw Bruce Beggs turn a vivid red and commence a pirouette.

To his credit, I never heard subsequently one word about my performance, indirectly or directly. In fact, a few years later Bruce went in to bat for me when the then Minister of the day, who wasn't too enthralled with my comments on canal developments in Mandurah, suggested that my career would benefit from a spell at Shannon River (yesterday's equivalent of Mundrabilla).

This event flashed back into my mind several months ago while I was escorting a very important group of people who I wanted to be impressed about a particular aspect of forest management we were practising in the Southern Forest.

Another young and impressionable public servant commenting on the particular feature of management made a comment which couldn't have been more designed to impress my visitors that I was wrong. The flashback came as I did my pirouette. (Fortunately for the young impressionable officer involved.)

The point of this nostalgic story is to emphasise that neither I nor any of the Corporate Executive will suppress people expressing genuine and scientifically based opinions about controversial aspects of land management. The caveat is, however, that they must be based on good science or good management, not on personal opinion or feelings.

Today the area we work in is 10 times more controversial than it was when I commenced working for the Forests Department more than 25 years ago. We are top of the pops in the political rankings of issues. This means that we must be doubly careful that the advice we give, and what we write, is of the highest quality and based on objective assessment of the facts.

Outside public service hours, everyone is entitled to their own opinion and to be a member of any organisation they wish. But everyone has to be extremely careful when they are speaking in their private capacity that their position is not confused with the Department's or that they are even perceived to be expressing a departmental view.

Departmental policy is the Government's policy, because the Government is elected by the people and they pay us.

Dr Syd Shea, Executive Director

Logging code

by John Clarke

Timber Production Branch recently distributed new editions of the Code of Logging Practice and the Manual of Logging Specifications.

The manual contains "everything you wanted to know about logging but were afraid to ask".

The Code of Logging Practice is an integral part of the contracts held by the 21 logging contractors who work for CALM.

It has stood the test of time, and is widely accepted by the logging industry in the south-west of WA. The November 1990 revised edition contains minor amendments only.

The Manual of Logging Specifications was first put

together in 1987. It consists of a synthesis of the many detailed prescriptions, checklists, procedures, administration instructions and guidelines that enable forest officers and CALM's logging contractors to implement the rules contained in the Code of Logging Practice.

Seven sections cover planning for logging, road construction and maintenance, silviculture, coupe management, environmental protection, log specifications and measurement and administration. The latest edition includes for the first time specific reference to logging on pine plantations (previous editions of the manual applied to hardwood logging operations only).

Art for nature's sake

An activity on *Art in the Environment* was held in Serpentine National Park during recent school holidays as part of its Fun and Recreation Program.

Rangers David Lamont and Bill Evans worked with Perth artist Laiene Maxted during the activity, which was one of the most popular of the program.

Kevin Jackson of Jackson's Drawing Supplies donated paints and discounted materials for the activity. He also gave the children vouchers for use at Jackson's retail outlets.



Perth artist Laiene Maxted helps children sketch and paint their interpretation of Serpentine National Park.

Praise for our parks

Tens of thousands of visitors camp in our state forests and national parks each year. Do they enjoy their stay? What sort of experience do they have? The experiences of one visitor are outlined in the following letter.

Dear Sir

My wife and I have recently completed a south west camping trip which included most state forest areas and national parks from the

Collie River, through the Blackwood River and D'Entrecasteaux National Park via Walpole, Denmark and Albany to the western side of Fitzgerald River National Park.

We were delighted to find (for the first time for some years) that the camping sites along the northern bank of the Blackwood, between Sue's Bridge and Jalbarigup Road, were clean of rubbish and litter. I would hope this is a result of campers be-

coming more aware of the need to protect and preserve our privilege of bush camping in state forest, although I feel this cleanliness may be the result of a clean-up by officers of your department - I hope the former is the case.

I found the CALM maps of each area to be of great help, allowing us to meander southwards through the forests and parks along forestry tracks, avoiding bitumen roads as much as possible. Two minor

problems I experienced were:

- some of the maps were not accurate in that now disused roads were shown as being in active use and some roads in active use were not shown.

- a number of road signposts were missing, sometimes making it difficult to locate our position on the map.

I appreciated the facility of CALM huts being available at Fernhook Falls, Centre Road and Mt Frankland (all north of Walpole) and the hut at Point Ann in the Fitzgerald River National Park, having camped in the huts at Fernhook Falls and Point Ann. The CALM facilities offered to the public, from bush camping with no facilities, through the facilities such as at Fernhook Falls to the relative luxury of Coalmine Beach Caravan Park offer a wide choice to the camping public.

The river crossing on Centre Road is a delightful spot, well complemented by the provision of the hut located there and compromised by the lack of a pit toilet, as shown by the large amount of soiled toilet paper and human excrement within the immediate and near vicinity of the hut. I would suggest consideration be given to the construction of a pit toilet at Centre Road. Further, could straw brooms be supplied for cleaning of the huts by those using these facilities?

I enjoyed the opportunity of meeting a team of rangers at Fernhook Falls and rangers at

Collie and Point Ann and learning a little of their thoughts, attitudes and responsibilities. They presented a positive impression of their role, in both the control and management side of their duties and their intent to encourage public use, enjoyment and appreciation of their area.

The installation of free gas cooking facilities to discourage ground fires (and the associated fire risk) is to be applauded. I feel the expense of this facility is warranted in sensitive areas and is a small cost compared with the massive destruction and cost of bushfires.

Whilst agreeing with the total fire ban which was in place in some of the areas visited I was surprised that this ban also excluded the use of portable gas stoves. I do not agree with the banning of gas stoves and, if this ban on gas stoves is to continue I feel your leaflets should allow for the use of portable gas stoves before and after stated times of day, particularly as most campers rely on being able to cook their food and enjoy a brew-up.

In conclusion, I thoroughly appreciate the facility of being able to camp in and enjoy our state forests and national parks and trust this will be available to the generations to follow. I have the feeling your work force is stretched a little thin on the ground, but applaud them for the job they do.

Yours faithfully

Chris Milne.

STAFF NEWS

Three graduates from last year's cadet school have joined the staff as park rangers. They are **Therese Jones**, Yanchep; **Bill Cuthbert**, Leeuwin-Naturaliste and **Paul Udinga**, Lane Poole Reserve.

Terry Bloomer, previously reserves management assistant, is now a mobile ranger, first posting South Coast Region.

Four graduates from the 1990 cadet school have taken up positions as forest rangers. They are **Daniel Hunter**, Kalgoorlie; **Mark Graves**, Nannup; **Edward Hatherley**, Bunbury Inventory; and **Mathew Lloyd**, Kirup.

Congratulations to three recent graduates: **Alan Scott** BA (Education) and **Bruce Richardson** BSc (Psych), both from Human Resources; and **Peter Heslewood** BA (Ind Relations), from Woodvale Research.

Appointment

Mike Yung, research scientist, Woodvale.

Promotion Confirmed

Kate Orr, planning officer, Planning Branch, Murdoch House; **Robert Rule** to forester, Harvey Wood Utilisation and Research Centre.

Transfers

Colin Verwey, forester, to Kalgoorlie; **Andrew Van der Wacht**, forest ranger, to Wanneroo; **Peter Hutchison**, training officer, Broome; **John Tillman**, forest ranger, Walpole; **Paul Brennan**, ADFO, Kelmescott Inventory; **Mike Tagliaferri**, forester, Dwellingup; **Anne Greig**, park ranger, Yanchep National Park; **Luke Coney**, park ranger, Hamersley Range

National Park. **Scott Godley** to mobile ranger - currently Yalgorup National Park.

Retirements

Peter Skinner, technical officer, Manjimup Research; **Barney Quicke**, forester, Harvey - began with Forests Department in 1954; **Don Greenwood**, park maintenance worker, Yanchep National Park.

Avoid strain

by Michelle Widmer

Ten minutes every morning is all that's needed to help boost health and safety in CALM.

After a health and safety committee initiative, personnel in Nannup participate each morning in exercises to help curb the large number of accidents which occur in this hazardous work environment.

When the program began, it concentrated on the vertebrae, but has since developed by strengthening and stretching most of the main muscles and joints.

Assistance from local chiropractors and physiotherapists who form an advisory role, and Wellness Australia which keeps CALM up to date with health and safety correspondence, the exercise program

is set to develop as participants increase their fitness.

It is anticipated that by the onset of winter, when most accidents occur due to cold muscles, the exercises will be carried out in the field just before commencing work.

If anyone is interested in finding out more about the program, please contact Tym Duncanson or Michelle Widmer at Nannup on (097) 56 1101.

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SANKO SPILL

CALM to the rescue

by TANYIA MAXTED

More than 30 CALM officers from Esperance, Albany and Perth were involved in one of the Department's largest fauna rescue and environment clean-up operations off Esperance between mid-February and mid-April. The Sanko Harvest oil spill in the Recherche Archipelago saw an eight-day emergency operation to save nearly 200 NZ fur seal pups coated in thick bunker oil, and nearly a two-month operation to clean beaches and coves in Cape Le Grand National Park polluted by the spill. Volunteers worked side by side with CALM officers in the seal-cleaning and beach-cleaning operations. They were replaced by paid casuals to finish the clean-up. Monitoring of the seal pups will continue over the next two years, and it is expected to take a winter of rough seas before the beaches at Cape Le Grand are restored to their original state. In this special four-page feature we look at the weeks following the wreck of the Sanko Harvest - a time of uncertainty, stress and solidarity.

It was a sad sight that greeted CALM officers on Sunday, February 17 when they discovered that the oil slick from the Sanko Harvest had struck Hood Island just four kilometres away from the wreck - home for nearly 40 NZ fur seal pups (a specially protected species under the Wildlife Conservation Act).

The following day would equally sadden CALM staff - in particular Cape Le Grand National Park ranger Ian Solomon - as the oil began to cover (to the high tide mark) the park's pristine white beaches.

CALM's fauna recovery and beach clean-up operations were headed by Esperance district manager Klaus Tiedemann and CALM's representative on the State Combat Committee for oil spills, Greg Pobar (operations liaison officer). Esperance wildlife officer Bernie Haberley was flown by helicopter to Hood Island with CALM workman Tony Byrne to start the seal clean-up, joined by local conservation volunteer Rob Stewart (member of LEAF - Local Environment Action Forum).

The Westpac Police Emergency Helicopter was dispatched from Perth to ferry workers and equip-

ment to and from the remote islands.

On Seal Rock where the second colony affected was found, Albany wildlife officer Peter Collins led the clean-up with other wildlife officers from Perth and volunteers. (Of the 18 people on Seal Rock, most - including Nick - were bitten and some needed tetanus shots.)

Not only did the 38 affected seal pups on Hood and the 160 on Seal have to be cleaned - involving three washes with two detergents applied, followed by a thorough rinse - so did their habitat. CALM staff and volunteers wielded high pressure hoses to clean oil from the rocks while natural wave action dispersed oil in the tidal pools.

The pups were treated before release by Dr Nick Gales, who flew from Perth to act as CALM's vet. Nick's role was to assess the animals' condition, taking blood samples, weighing and tagging the pups and feeding glucose directly into their stomachs through a tube.

Nick consulted experts who had run the sea otter rescue operation during the Exxon Valdez oil spill in Alaska. He said the effect of oil on seal pups was similar to that on the otters

as they both had the same dense underfur. This was to cause the animal's metabolic rate to rise, making it difficult to regulate its body temperature.

Nick told a press gathering he would be surprised if no pups were lost. In the wild the animals had about a 10 per cent mortality rate, he said, and these pups had endured a lot of stress. Sadly, there were several deaths - in the month following the spill 10 seal pups died.

UNDISTURBED

After the emergency clean-up, the islands were left undisturbed for a week at Nick Gales' request. Aerial surveillance of other islands located a pair of Australian sea lions on Figure of Eight Island (near Seal Rock) that had been oiled. These animals are large and become aggressive when approached, so it was decided to monitor their progress rather than attempt to catch them. Nick Gales said the oil would not have the same effect that it did on the fur seal pups as the sea lions didn't have the same dense underfur.

Also found during aerial surveillance was an unaffected colony of 163 NZ

pups on rocks west of McKenzie Island, far south of the Sanko Harvest wreck. It was decided that this colony would be monitored as a control for Seal Rock, which had about the same number of pups.

On the first revisit to Hood Island, Bernie Haberley and Greg Pobar were unsettled about what they had found: they believed that a sizeable percentage of the animals there had lost weight and some would not survive. On Seal Rock, 80 per cent were judged healthy, with 20 per cent giving rise for concern. From the Hood Island information it was judged that 40 per cent were in poor health: at least five weren't expected to survive.

On the advice of Nick Gales, it was decided not to euthanase the sick seals or attempt to remove them from the islands for forced feeding, since it was judged this would disturb other pup-mother bondings. All monitoring ceased for three weeks. During this time, the insurers of the Sanko Harvest agreed to fund a \$50,000 seal-monitoring program to assess the recovery of the fur seal pups.

Three visits are being made over the next 10 months by CALM officers



Dr Nick Gales and operations liaison officer Greg Pobar check tagging equipment before setting out for the islands. Photo courtesy The West Australian.

- the first towards the end of April, the following two in July and in February, after the next pupping season.

FOCUS SHIFTS

Once the emergency seal pup clean-up had finished, the focus shifted to the Cape Le Grand National Park beaches. Operations stretched over two months to rid the park of oil. It had been closed immediately following the spill and local caravan park owners close by started receiving cancellations. Oiled, dead seabirds were found and volunteers, coordinated by CALM rangers in the park, combed the coastline for other affected wildlife.

Worst affected by the spill were Lucky Bay, Rossiters Beach, Dunns Rock, Hellfire Bay, Thistle Cove and Mississippi Point. The latter three were inaccessible to vehicles.

A priority order for the clean-up of the main tourist beaches was established - the first being Lucky Bay - and a busy bee was organised for volunteers to help hand-clean the beach. (The Esperance Shire also organised volunteer clean-ups with schoolchildren and locals.)

Oiled sand removed by machinery from Lucky Bay was taken to a temporary holding site at Frenchman Peak within the park and was gradually moved to another holding site on private property.

With the return to their parks of staff who had been pulled in to help in the seal operation, a report came into the Esperance office about oil at Stokes National Park. Five new coastline sites affected by the spill were found - the furthest

of which was 118 km from the wreck at Lake Shaster Nature Reserve, west of Whale Beach.

The worst affected of the west beaches was a bay near Quagi Beach, east of Stokes on unvested nature reserve proposed for inclusion into the park. Beaches stretching from Stokes Inlet to Margaret Cove were contaminated with tarballs.

CALM ranger Rick France reported a lot of debris from the Sanko Harvest in the waters. He had filled a ute-load with wood, rope ladders and other flotsam which was then handed over to Customs.

Oil that had been sitting trapped in a rocky cove between Hellfire Bay and Thistle Cove in Cape Le

Grand (which became known as Boulder Hill Cove) was surrounded with two absorbent booms by Marine and Harbours to ensure that it would not flow out to the beaches.

With the availability of volunteers diminishing, 24 local unemployed people registered with the Esperance CES were contracted to continue work on Cape Le Grand's beaches filling thousands of bags with contaminated sand, which were then airlifted by helicopter onto trucks and taken to the Esperance tip. Most of these were supervised by CALM officers; eight were initially supervised by the Department of Marine and Harbours in Boulder Hill.

continued on page 4



The Westpac Police Emergency Helicopter prepares to airlift CALM staff, volunteers and their equipment from Seal Rock. Photo by Brenton Siggs.



Albany wildlife officer Peter Collins inspects a dead oiled seabird during the emergency operation's first days. Photo courtesy The West Australian.



Controller Klaus Tiedemann and wildlife officers Peter Collins (Albany) and Bernie Haberley (Esperance) examine data from Hood Island and Seal Rock. Photo by Tanyia Maxted.

continued from page 3

More oil washed ashore from the Sanko Harvest in early March. One of the helicopter pilots reported an oil slick of about four-and-a-half kilometres heading in a north-east direction from the wreck towards the park. Work cleaning Lucky Bay had been discontinued due to fresh staining by the pollutant.

While overflying the wreck, operations liaison

officer Greg Pobar reported that the back of the ship was missing and that more oil was coming out. Thick weathered oil could be seen 200 metres off the park's beaches in large patches. The new pollution was seen between Cape Le Grand and Rossiter Bay - a total area of 25 kilometres.

The new pollution disrupted work on Thistle Cove: the removal of bags was hampered by the loss of service of the Westcoast

helicopter, which had had to make an emergency landing on Hastings Island (no CALM staff on board.)

At Boulder Hill Cove, some of the oil previously trapped there escaped and oil was being washed by heavy seas out of the bay towards Thistle Cove.

Klaus Tiedemann met with Marine and Harbours and the insurer's representative Terry Hayes to discuss continuing operations. It was considered not worthwhile continuing the clean-up while new pollution washed ashore.

After a three-day lay-off, work resumed on the beaches. More than 5,000 bags of contaminated sand were airlifted onto waiting trucks, which removed the material from the park.

Mississippi Beach and Boulder Hill Cove were next: sites requiring access by helicopter. Both were difficult to clean due to their isolation and the amount of oil affecting them. These were finally restored, with controller Klaus Tiedemann ending operations on April 18.

A review of the cleanliness of the beaches will be made in early spring following the winter storms.



Brenton Siggs of Esperance - firstly a volunteer, later a paid casual - comes to grips with sludge at Boulder Hill.

CALM WELL PREPARED

by Greg Pobar

The Sanko Harvest oil spill is not the first in which CALM has been directly involved. There have been a number of incidents in recent years that have had the potential to impact on our conservation estate or wildlife. CALM's involvement and role, and the skills levels and knowledge of staff, have been reassessed after each.

Oil pollution events occurred within the Metropolitan Region during 1986 and 1987 which threatened island reserves and marine wildlife. The high degree of public concern, the little training and expertise within CALM, and the lack of understanding

of the value of our natural marine assets generally outside of CALM were concerns identified during these events.

During 1987, an oil spill contingency plan was drafted for Metro Region. It was a simple plan that addressed these concerns and went one step further in defining CALM's role. It was drafted under the umbrella framework of the State and Commonwealth Oil Spill Prevention Plans.

CALM personnel immediately undertook oil spill operator courses through the Department of Marine and Harbours and learnt about equipment available and techniques required for an oil spill clean-up.

CALM took steps to

ensure that its role as manager of marine estate and wildlife was understood by the Combat Committee. This resulted in CALM being nominated as an advisory authority to the committee only a few weeks before the Sanko Harvest ran aground.

Liaison between relevant authorities and CALM has continued, with CALM playing a major role in the Hillarys Boat Harbour Emergencies Plan, as developed by Marine and Harbours.

Marine park management plans also address the requirement for contingency planning in the case of an oil pollution threat.

All this has resulted in a high degree of preparation. Through reassessment,

debrief and further training, CALM will be even better prepared if such an event recurs.

It's necessary for the Department to plan and train for such events. The Esperance spill involved all Esperance District staff for at least a month and clean-up still continued two months later. It's obvious that such events can take time, and therefore much support by way of skills and knowledge will be required.

It is planned to ensure that all regions and districts become familiar with oil spill prevention and clean-up, and in time each will develop contingency plans to prevent or minimise oil spill impacts on CALM estate.

Cape Le Grand six weeks later

by Tanyia Maxted

I returned to Esperance on annual leave from March 24 until March 30 - six weeks after CALM's operations began. Work continued at Boulder Hill Cove, where tonnes of bunker oil had been trapped since the first spill - some of it in sludge pools a metre thick.

Eager to see more of Cape Le Grand National Park than I had (I'd made one brief visit to photograph the affected beaches during my working time in Esperance), I hiked from the Thistle Cove carpark over the granite hills to Boulder Hill Cove with one of the volunteers who had worked on Seal Rock. Another hiker we met was carrying messages backwards and forwards to the carpark from the cove as radio communications were

limited. The helicopter pilots could only communicate with the workers by radio as they hovered above them.

Thistle Cove still bore a light stain, but was clean compared to the last time I had seen it. (I'd get to see Mississippi Bay the following day where there was still weathered oil and debris in the shorebreak.) It takes an hour to walk over into the bay, and as we came in sight of it we could hear the dull thud of a generator and smell oil. Below us moved a small army of white overalls.

And then we saw it. Black rocks; tarry sludge; drums full of oil ready to be airlifted; workers using high pressure hoses to get the dried pollutant off the rocks; makeshift clotheslines sagging under the weight of oil-encrusted waders; and the odd oiled, dead crab.

HELICOPTER

To the right of the cove a narrow track had been cut out of the bush for safe passage around the oil and to get supplies in and out. We heard the rotor slap of the approaching Westcoast helicopter and looked up as it passed overhead carrying in an empty 44 gallon drum.

In the water about 20 feet in front of us, CALM forester John Winton had positioned himself in a small flat dinghy containing a full drum of oil next to a horizontal rope extending across the narrow cove.

To our amazement (we'd never been so close to a flying helicopter - close enough to be blasted by the rotorwash) the pilot manoeuvred the aircraft into a hover directly above John.

seemingly almost level with us on the rocks, to hook up the 40-foot wire strop extending from the undercarriage. John grabbed the strop and hooked the drum onto it while balancing himself as the rotorwash rocked the tiny boat; the helicopter then lifted the drum clear.

From an onlooker's perspective the operation in that little cove looked like something out of a Vietnam war movie, and left one with a feeling of nothing but respect for both the workers on the ground - who had to endure the oil stench and conditions working in it - and the skill and safety-consciousness of the helicopter pilots.

Later that afternoon I stood a hundred feet or so above the cove on a sun-bathed rocky ledge overlooking the Recherche

Archipelago and the granite edges of the park - one of the most stunning views I've ever experienced. The clean-up army was hidden, and for a while, I almost forgot it was there. Then the distant hum of the generator reminded me that in one little corner of this breathtaking wilderness, the oil remained. The Sanko Harvest saga continued.

It seemed incredible that while the media and public interest had long since waned and those pulled in to Esperance had long returned, it was still all go in Cape Le Grand with trucks, drums and helicopter operations. It would be several weeks before they would leave the cove, before the wild beauty of Cape Le Grand was left silent for admirers, as it should be: undisturbed.



CALM staff and volunteers deoil a bemused NZ fur seal pup on Hood Island. Photo courtesy of The West Australian.



Thistle Cove at Cape Le Grand six weeks after the first spill - it had already been cleaned once and a seam of oil lay underneath the sand. Photo by Tanyia Maxted.



Nearly two months after the spill Boulder Hill Cove was still full of oil sludge; a massive manual and airlifting operation finally finished there on April 18.



Not-so-Lucky Bay, the second time around. Photo by Tanya Maxted.

Volunteer effort

Volunteers from all walks of life gave up their free time to help CALM save NZ fur seal pups and other wildlife affected by the Sanko Harvest oil spill off Esperance and clean polluted beaches at Cape Le Grand National Park.

Esperance locals - some of them members of LEAF, the Local Environment Action Forum - registered in their droves. More than 250 names were taken by the CALM Esperance district volunteer coordinator John Winton.

Volunteers joined CALM officers airlifted onto the islands by helicopter for the intensive clean-up operation. Working in teams, the volunteers caught and penned the pups to wash them. They then worked with

CALM vet Dr Nick Gales to weigh, measure and tag the pups, take blood samples and treat their infected eyes.

Volunteers also used high pressure hoses and scrubbing brushes to clean the rocks to ensure that the pups would not be reoiled.

Briefings for the volunteers were held each evening at the CALM Esperance office. Tales of seal bites and other antics flowed, and the evening news was watched by all; the volunteers laughed as they saw themselves on national television covered in oil trying to avoid the razor-sharp jaws of snapping seals.

As the focus changed from seals to beaches, volunteers were picking up shovels instead of pups. Other volunteers had also

helped search along nearly 100 km of affected coastline for oiled wildlife, catered for food and transferred other volunteers from site to site.

CALM Esperance district manager Klaus Tiedemann, CALM controller throughout the operations, thanked all the volunteers for their efforts. He said there had been a quick response to assist CALM.



MORALE

Such numbers allowed CALM to organise teams to search over 100 kms of coastline on the mainland for oil-affected wildlife, put teams on Hood Island and Seal Rock to clean seal pups and begin cleaning popular park visitor beaches inaccessible to vehicular traffic. The goodwill and morale maintained throughout were pleasing to observe and are a credit to all who participated. Although there were a few situations where some individuals were exposed to an element of risk, safety and the health of all participants were paramount.

At the conclusion of each day's operation, debriefs were held and all participants were invited. This ensured a continual flow of up-to-date information to everyone involved.

The difficulty of access

The aftermath of any disaster, natural or man-made, leaves those involved with vivid thoughts, feelings and memories. What follows are the personal reflections of some of the people closely involved with the Sanko Harvest clean-up operation.

I cannot praise enough the efforts of all CALM staff and volunteers who over a period of two months contributed so much in ensuring the success of this operation. Many were placed daily in what normally would be considered unenviable situations.

The operation's initial success can be directly attributed to four main areas. Firstly, our ability to set up an organisational structure along the lines of a Large Fire Organisation (LFO) proved invaluable. Although CALM was not the controlling agency in this operation I am sure other government departments who may be involved in future oil spills should look at our system and adopt a similar structure.

Apart from individual sector bosses, key roles proved to be the interdepartmental liaison officer, media officer, supply officer, administration officer and district volunteer coordinator. I would personally like to extend my sincere appreciation to Greg Pobar and Tanya Maxted who admirably filled the first two roles mentioned.

The second reason for our success was the almost immediate and overwhelming response from the public who volunteered their services. Within the first day of the vessel breaking its back and spilling oil into the sea, district volunteer coordinator John Winton had received over 250 offers of assistance.

to the islands and to isolated oil-affected coves and bays along the mainland could, under normal conditions, have greatly hindered, and in some cases prevented, any course of action to be taken. What was a five-hour trip by boat to Hood Island became an eight-minute trip by helicopter. Similarly the use of a helicopter enabled a team of 12 to be airlifted daily to Seal Rock. Normally access to this island is gained by swimming ashore from a boat!

The removal of more than 5000 bags of oil-contaminated sand from isolated beaches took only a few days. It would have been weeks had they been manually removed.

THANKS

My personal thanks go to the pilots and crews of the Westcoast, Police-Air and Channel 7 helicopters for their untiring efforts. The value of helicopters in this operation cannot be over-emphasised.

The cooperation and assistance provided by other government departments such as Marine and Harbours, Police, Bush Fires Board and State Emergency Service, and local organisations such as the Esperance Local Environment Action Forum (LEAF), is also appreciated and acknowledged. Similarly, I would like to thank the media for the initial use of their helicopter.

Finally, the dedication and professionalism shown by all the CALM staff involved reflects highly on the Department, demonstrating it to be a very capable land management agency.

Klaus Tiedemann
CALM Esperance
Oil Spill Controller

At the height of the clean-up, about 30 CALM staff and more than 200 volunteers were working at seven different locations on six

different tasks. You know it's busy when, in between island oil reconnaissance flights, the aircraft were heading inland to plot fires. One wall of the operations room in the district office plotted these fires, the other oil pollution.

How did it all come together and stay together? The key to the operation's success can be attributed first of all to the Esperance district office. The district manager Klaus Tiedemann, forest officers, park rangers, wildlife officers, office staff and their families are an example of the skill levels in CALM and the success of the operational procedures adopted.

Secondly, individuals and local groups who volunteered their own skills, knowledge and time were an integral part of that team. The response and enthusiasm were incredible and were responsible not only for the success of the clean-up, but also for motivating CALM staff when morale was down.

It was a hazardous en-

vironment in which to work, involving flying long distances over water, working on islands that offered no shelter, at risk from wildlife such as snakes and aggressive seals, and having to contend with flight plans that couldn't confirm being lifted off the islands that day.

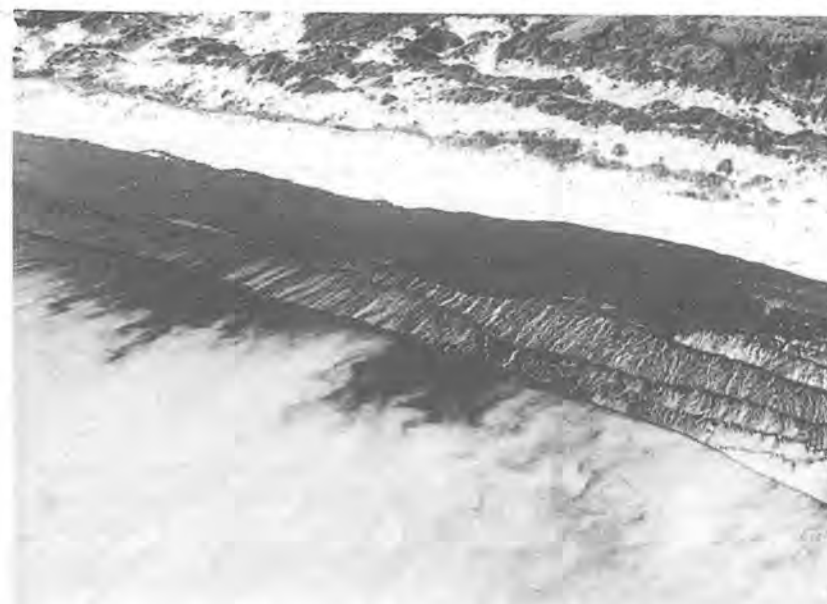
It was also a stressful and emotional environment. Imagine your initial shock at finding oiled pups, seeing some of WA's best beaches and islands polluted, or finding oiled penguins on the beach. Then imagine the jubilation when pups are cleaned and released and beaches are clean - and then the shock of seeing them polluted again, and to learn of pups not surviving the incident. These were the experiences of hundreds of volunteers and CALM staff.

But what were the results of the operation, other than the survival of the majority of the seal pups, clean islands, clean

continued on page 6



Jo Myers, of Esperance, lends a helping hand to a seal pup. Photo by Brenton Siggs.



Cape Le Grand National Park from the air several days after the Sanko Harvest ran aground. Photo courtesy The West Australian.



A cove full of sludge in Cape Le Grand National Park. Photo by Brenton Siggs.

Personal reflections cont. . .

beaches? New skills, increased knowledge, excellent liaison with other departments and agencies, public support, better procedures and new friends are just a few.

Greg Pobar Oil Spill Operations Liaison Officer

Late Sunday afternoon, February 17: home in Perth. I hadn't heard about the Sanko Harvest running aground. Blissfully unaware, I'd spent the weekend relaxing, and was slowly gearing up for the week ahead. Then came the phone call: book a seat on Skywest - OIL SPILL. Little over an hour later I was on a plane bound for Esperance; what did it all mean?

Later that evening I knew - oiled NZ fur seal pups, dead sea birds, black beaches. Early Monday morning the phones began to ring. By 8.30am 12 radio bulletins had gone to air in Perth about CALM's operations. By the end of that first media day, 33 radio bulletins had been broadcast. That night TV news showed oil-soaked seals and dead birds. It was just the beginning.

PROFESSIONAL

In the operational structure, I was under the controller (Klaus Tiedemann, Esperance district manager) with Greg Pobar, who was operations liaison officer and CALM's member on the State Combat Committee. It was a professional and smooth operation - changing in size to the point where, once the second seal pup colony affected by oil was found, 60 people were suddenly involved in the office and in the field (several were pulled from Albany and Perth) and we had the use of the Westpac Police Emergency Helicopter.

Based in Greening Australia's office opposite the operations room, I could hear incoming radio schedules and reports, could grab CALM officers as they walked past to extract information from them, constantly check facts and figures with Greg and Klaus and receive typed internal updates from intelligence officer John Winton.

A two-way radio in my office served as a direct

link to Marine and Harbours' two main representatives in Esperance - Ian Harrod, the Esperance harbourmaster, and Con Sappelli, pollution combat officer.

From information gathered (we didn't comment on Marine and Harbours operations) I continuously prepared radio reports for hungry media and issued typed updates (in all 360 individual faxes were sent from the poor Esperance fax). Three press conferences were held, along with onsite media briefings. We were in the office before 7am and, especially during that first week, didn't leave before 8pm. No one complained.

I wasn't pulled (or was that dragged) out of Esperance until Friday, March 1 - 12 days after stepping off the Skywest flight. It was enforced rest over the long weekend and then return to Esperance courtesy of Westpac Helicopters on KKY - the Bell Jetranger based in Esperance for the whole operation - on Wednesday, March 6. My manager didn't see me again until the following Tuesday.

I was impressed with the way CALM Esperance staff handled the crisis, especially considering they'd been battling major fires in their area since Christmas. Several staff when they finally stood down for a day were seen in the office on more than one occasion!

STRESS

There was evidence of stress among us, stress relief and humour. Like the time Bernie, Greg, Klaus and others totally convinced John Winton that the 15,000 tonne stern section of the Sanko Harvest had broken free and ended up on one of the Cape Le Grand beaches.

As well as staff antics, the volunteers also injected a lightness into the serious situation. A second briefing at the end of the day with the back room packed full of volunteers was as much a de-stress as a debrief. And after the emergency had passed and operations wound down a little, differences of opinion and anyone who stepped out of line were dealt with with a new management technique - a nifty jet wa-

ter pistol.

I learnt a lot from my time in Esperance (in all nearly 18 days): about the people I worked with, about the two government departments and about oil spills. Others learnt a lot too. This knowledge I am sure will be shared with other staff throughout the Department to ensure that next time - if and when this sort of crisis affects our estate and wildlife again - we'll be even readier for it.

Tanyia Maxted CALM Media Liaison Officer

The most rewarding, demanding and interesting task I have flown in 22 years of helicopter aviation is the only way to describe what I and other company pilots have just completed in Esperance.

I was particularly fortunate to fly both the Westpac Police Emergency Rescue Helicopter during the seal rescue and subsequently the Westpac helicopter during the clean-up at Cape Le Grand. The Police Squirrel flew 57 hours for the operation; the Westpac Jetranger about 300.

The islands were interesting landing sites as the Police helicopter is choosy about where it lands due to its low skids. With two crews, the aircraft flew CALM staff, volunteers and their equipment into both sites. A return visit later flew extrasorties for CALM to monitor and observe the colonies. In all, Westpac Polair moved more than 130 personnel and 2.3 tonnes of support equipment and stores.

FRIGHTENED

We were fortunate to be able to shut down on Seal Rock and watch and assist with seal capture and clean-up - not always voluntarily. Now, when you've got a 10 kg seal pup that doesn't want to be caught, you have to go in after him. That might not sound difficult, but when a volunteer has to crawl 10 or 15 feet into a wet slimy crevice in pursuit of a frightened and snapping pup, if he's able to get a grip and fling the pup out, he's not too particular about who is on the receiving end, and you have to catch them,



CALM officers check contaminated sand bags before they are airlifted to Thistle Cove car park.

otherwise all the crawling, yelling, swearing and cursing has been wasted, and believe me, oil-coated seal pups are a different kettle of fish to the gentle, furry doe-eyed cuddly creatures you've seen at Atlantis or the zoo.

MAGNITUDE

The magnitude of the clean-up at Mississippi Beach and Boulder Hill defies description. It was decided to turn Thistle Cove carpark into Thistle Cove International Airport and support both operations from that point.

All personnel and stores were again flown into both areas, apart from a brief early phase of walking personnel in, and boating stores into Boulder Hill. A 90-second helicopter ride was deemed preferable to a 45 minute hike into Boulder Hill, and helicopter was the only way into Mississippi.

It must have been soul-destroying to clean the beach one day and fly in the next morning to find it filthy and black, and to start all over again knowing that tomorrow it would be just the same.

At Mississippi, 15kg bags were hand-filled with contaminated sand and further loaded into larger airtransportable bags (between 12 and 18 bags in each), then hooked up to a 40-foot wire rope strop and flown out to Lucky Bay where it was unloaded onto the back of a truck. That was ranger Ian Solomon's domain, and it was there that the Solly dance was invented. All credit to Ian; neither did he get hit, nor did he abandon truck!

At the start of the airlift operation the average cycle time - beach-truck-unhook-beach-hook-up was seven minutes. After a couple of weeks we were able to reduce that to be consistently under five minutes and one cycle broke the four-minute mark.

Boulder Hill was the most difficult, but interesting and often amusing aspect of the whole beach

operation.

The problem here was that being a small and narrow cove it was subjected to strange wind effects. Our landing pad - a generous description - was a rock at the edge of the cove that sloped markedly either towards the water or the hill, depending upon which way you looked at it. There was only one place that would allow us to land sufficiently level and stable to get passengers and stores on and off.

With wind, turbulence etc combining to put the helicopter between that rock and a hard place, there were interesting landings and even more interesting expressions on the faces of passengers.

Stores taken in and out included drums of fuel and water, rakes, brooms, backpack sprayers, degreasers, detergents, generators, high-pressure steam cleaners, absorbent pads and empty 200 litre drums.

INGENUITY

Moving these drums when full of oil was a major hurdle, but with local ingenuity and resources, two hooks were made to go on the end of the strop and holes punched through the top of the drums' sides. No one knows exactly how many we airlifted, but it has to be close to 500 drums of muck. And all that without one dropped load, or one injury.

Throughout the whole operation the one permanent memory will be Bernie Haberley, black with sludge under a safety helmet having a pure white, freshly lit cigarette blown from his mouth either by the helicopter downwash or the hooks swishing past his ears. And the lasting and refreshing impression that I have to take away from it all is the camaraderie, resourcefulness and perpetual cheerfulness that pervaded. An effort we can all be proud of, and thank you for the friendships and memories.

Clive Mayo
West Coast Helicopters

DIARY

Thursday February 14

Sanko Harvest runs aground off Esperance. State Combat Committee meets to discuss contingency plans (CALM's representative on committee dispatched to Esperance). Booms rigged around the ship to contain the spill (at this stage only a very small leak of oil).

Friday February 15

Ship abandoned by 5pm. CALM spotter plane flew over stricken vessel in the morning to determine spread of oil sheen.

Saturday Feb 16

Ship starts to break. Oil leaking from the wreck on the reef side. Oil and phosphate lost from the ship treated with dispersants.

Sunday Feb 17

NZ fur seal colony on Hood Island found to be affected by oil. Two CALM officers flown onto the island. Exclusion order placed on area to prohibit access by boats and aircraft. CALM media liaison officer dispatched to Esperance.

Monday Feb 18

Overnight ship split and sank. Only bridge remained above waterline. All 30,000 tonnes of phosphate lost. Clean-up on Hood begins with CALM officers and LEAF volunteers. Oil washes up on Cape Le Grand National Park beaches.

Tuesday Feb 19

Dispersant spraying by helicopter continues. Seal Rock NZ fur seal pup colony found oiled. A CALM wildlife officer and Dr Nick Gales arrive from Perth.

Wednesday Feb 20

Environment Minister Bob Pearce and CALM Executive Director Dr Syd Shea fly to Esperance to see situation first-hand. Go-ahead given for a helicopter to be used: Westpac Police Emergency Helicopter dispatched to Esperance. Wildlife officers and a marine park ranger arrive from Perth for clean-up.

Thursday Feb 21

First release of seals from Hood Island. Clean-up begins on Seal Rock using volunteers and wildlife officers (18 people altogether). Island inspections begun with police helicopter. First death of oiled seal pup on Hood Island.

Saturday Feb 23

First release from Seal Rock. About 100 pups had been tagged and treated. Volunteers help CALM clean Lucky Bay and Dunns Rock. Reports of seal pups rejoining their mothers received. One pup seen suckling for 20 minutes.

Sunday Feb 24

Six pups found dead on Seal Rock; they died before they could be released - nearly 160 released. Everyone airlifted from the rock by helicopter, islands to be left undisturbed for a week. Unaffected colony of seals found on rocks west of McKenzie Island, far south of Sanko Harvest wreck. Volunteer beach clean-up continues.

Monday Feb 25

Wildlife officers return to Perth. CALM concentrates operations on beaches at Cape Le Grand in liaison with Marine and Harbours and Esperance Shire. It is hoped to reopen some areas of the park by the long weekend.

Tuesday Feb 26

Five new coastline sites affected by the oil spill discovered west of Esperance. Oil and debris drifted 118 km to as far away as Lake Shaster Nature Reserve west of Whale Beach. Beaches at Stokes National Park affected. Ranger Rick France loads ute with debris to be handed to Customs.

Wednesday Feb 27

Seabird toll now 10. Beach clean-up continues at Hellfire Bay with the help of volunteers.

Thursday Feb 28

Public warning issued as medicinal supplies wash ashore at Stokes National Park. Hand-cleaning of beach continues. Cape Le Grand National Park opened to the public except for three beaches: Thistle Cove, Mississippi Pt and Rossiter Bay. Beachcleaning by Esperance Shire begins at Quagi Beach east of Stokes Inlet.



Thistle Cove six weeks after the spill: bags wait to be airlifted out, as more oil washes ashore. Photo by Tanyia Maxted.

Friday March 1

Japanese vet arrives in Esperance to study effects of the oil spill on marine life. CALM liaises with local conservation group LEAF to organise large volunteer effort on beaches over long weekend.

Tuesday March 5

Japanese vet arrives in Perth, hands over cheque for \$1000 to CALM for volunteers before flying on to Bahrain via Japan to work on huge oil spill in the Gulf.

Wednesday March 6

CALM officers begin monitoring fur seal pups on Hood Island.

Thursday March 7

CALM officers unable to carry out survey work on Seal Rock as helicopter being used for Marine and Harbours operation. Westpac Police Emergency Helicopter flies back to Esperance.

Friday March 8

Island monitoring finished, results show that 40 per cent of the seals on Hood Island are looking bad.

Saturday March 9

Aerial inspection of nine islands. Work continues at Thistle Cove where 24 paid workers help CALM officers hand-clean the beach. Thousands of bags containing contaminated sand are being lifted by helicopter onto a truck to be taken to the Esperance tip.

Large patches of weathered oil start to wash ashore in the park. The pollutant is reported in varying degrees over a 25 km area between Cape Le Grand and Rossiter Bay. Newly affected areas include Hellfire Bay, Thistle Cove and Lucky Bay.

By late afternoon the new pollution disrupts work on Thistle. Work further hampered by the loss of the services of the Westcoast helicopter which made an emergency landing on Hastings Island. No CALM staff were on board.

Oil previously trapped in a rocky cove west of Thistle, where workers had been handfilling 44 gallon drums, begins washing out of the bay. Sighting of oiled seabirds, including a dead oiled penguin.

Tuesday March 12

Beach clean-up temporarily halted to allow weathered oil to wash ashore. Workers stood down until Friday. At Rossiter's Bay 50 tonnes of buried oil from one first oil slick remains on the beach - affecting an area of more than a kilometre. Australian gannet that had been looked after by CALM and volunteers released.

Thursday March 14

Airlift operations to remove oil in drums begins (continues for another six weeks).

Thursday March 28

Last of the bags airlifted from Mississippi Point on Wednesday. Drums continue to be airlifted from oiled cove. Westcoast helicopter KKY flies back to Perth. Workers stood down over Easter.

Tuesday April 2

Work resumes at Cape Le Grand in Boulder Hill Cove.

Thursday April 18

Airlifting and ground operations at Cape Le Grand officially wound up.

Farming with trees

by David Gough

Many farmers in the South West are concerned about salinity on their farms. Eucalypts planted at wide spacing look promising as a solution. Studies by the Water Authority at agroforestry trials near Mundaring show that wide-spaced stands of trees can lower water tables by one metre in 10 years - thereby helping to combat salinity.

The benefits of agroforestry are not restricted to helping to combat salinity. In higher rainfall areas where salinity is not such a problem, the main benefits of agroforests are improved shelter and increased productivity. Evidence from 10 years of study with wide-spaced pine trees shows that the trees and pasture in combination are more productive than pasture alone. Although there is little data for eucalypts as yet, it seems likely that the same benefits can be gained from eucalypt agroforestry. In 1987, trials were established on farms around the South West to provide more information about this.

One of the trials is on Dick and Sue White's property at Dinninup. The Whites had been concerned about increasing salinity on their property for some time when Richard Moore (agroforestry researcher with CALM) approached them about the possibility of working together on an agroforestry project. The other sites are at Middlesex and Busselton.

The trial consists of three species: *Eucalyptus saligna* (Sydney blue gum), *E. maculata* (spotted gum) and *E. microcorys* (tallow wood). The trees can be put to a range of uses if income from trees is required in addition to the benefits of shelter and reduced salinity. In the case of the Whites, the trees are being grown for high-quality sawlogs - for use in furniture and panelling.

There are many suitable arrangements of trees planted for agroforestry: distance between rows can range from 10 to more than 50 metres apart. In many situations it is likely that farmers will use other strategies, such as drainage and perennial pastures, in conjunction with trees to increase the impact on salinity. The Whites' trees have been planted in rows 15 metres apart with two metres between trees in the row. Under these wide-spaced conditions it is expected that the fastest growing species (Sydney blue gum) will take about 20 years to reach sawlog size.

The trial is also investigating the growth of three provenances (families) of each species. It is important to do this because different provenances of the same species can grow very

differently. It would be easy to conclude that a particular species was no good based on the poor performance of just one provenance.

The success of the project and the production of good quality timber depends a lot on management. The trees were planted in 1987 - a dry year with only 395 mm (15.5") of rain at Dinninup - and yet about 85% of trees survived the first summer with no watering. This success can be attributed mainly to very effective control of weeds around the seedlings. A strip of pasture 1.5 metres wide was sprayed with herbicide before the seedlings were planted.

From about three to six years of age the poorest 75% of trees are culled. The trees that are kept are pruned to produce a high-quality sawlog and to let in light for pasture. The first culling and pruning at Dick White's was carried out last autumn.

Tony Albertson from the Department of Agriculture in Bunbury is monitoring pasture changes under the trees. As the trees grow, a decline in the amount of pasture is expected. Whether the decline is the same under all species of

tree will also be determined. During the first two years Dick White made hay between the rows of trees. He started grazing during the second year. He has found that grazing with a large flock for a few days works well. The sheep are removed before they show much interest in chewing the bark.

It will be some time

before there are conclusive figures on the income farmers could expect from combining eucalypts and livestock. However, the evidence from agroforestry trials with other types of trees shows that combinations tend to be much more productive than either trees or pasture alone. Together they are able to make more effective use of nutrients,

moisture and sunlight. Shelter in an agroforest also leads to greater productivity. Furthermore, high-quality timber can provide a substantial income for the farmer. With planning, trees can be harvested and regenerated in a staggered manner around the farm so that the environmental benefits, such as salinity and shelter, are maintained.

Kyana Festival

The first Kyana Festival, an Aboriginal cultural festival organised by the Dumbartung Aboriginal Artists Corporation, was a resounding success.

The two-day festival in February featured a large CALM display.

"The CALM tent was one of the festival highlights," said CALM wildlife officer Trevor Walley, "even though we had to rely on existing displays and the goodwill of volunteers."

CALM's exhibit included a kids' corner with a tree house, a wetland and an animal enclosure, large jigsaws and a 30-metre long hessian corridor

screenprinted with animal footprints.

A herpetologist from Perth Zoo provided a dugite, death adder, tiger snake and carpet snakes, and mammals on display included a joey and wombat.

"I'm still getting great feedback about it," Trevor said. "Many festival visitors appreciated our display's theme of getting back to the bush."

Staffing of the display was coordinated by Trevor. Many of CALM's Aboriginal employees helped out, including Helen Lawrence, Lance Jackson, Hardie Derschow and Boyden Yarran.

Non-Aboriginal participants included Gil Field,

Rae Burrows, Stev Slavin and John Goodlad.

"CALM's participation in the festival was seen by many Aboriginal and non-Aboriginal people and festival organisers as an important step towards achieving understanding and co-operation between CALM and Aboriginal people," Trevor said.

He thanked all CALM staff, both Aboriginal and non-Aboriginal, who participated and said that there was good all-round involvement.

Organisers are planning another festival and have asked CALM to be involved again.

ILLEGAL

- OR JUST PLAIN UNFAIR?

Even though all of us work to eliminate unfair, unjust or inequitable behaviour or structures in our workplace, we may occasionally be faced with a situation that seems unfair to us. However, not all forms of unfair behaviour are unlawful in terms of the Equal Opportunity Act 1984 (EO Act).

The Equal Opportunities Act 1984

According to the EO Act, it is unlawful to treat one person less favourably than another (i.e., to discriminate against them) because of their race, marital status, sex, pregnancy, religious or political conviction, or impairment.

It is unlawful to discriminate against such people in the areas of employment, provision of goods, services and facilities, education, accommodation, clubs, application forms, or access to places and vehicles.

But the Act does make provision for exceptions, for example, ethnic or single-sex clubs, accommodation in private households, residential care of children, insurance, genuine occupational qualification.

This does not mean that other forms of discrimination or harassment are condoned or even desirable, but they may not be unlawful.

Victimisation or personality clash

Ill-feeling or victimisation is always unpleasant, unproductive and undesirable, and steps should be actively taken to resolve it. However, no matter how unpleasant and unproductive these sorts of behaviours are, they are not necessarily unlawful under the terms of the EO Act.

Missed promotion/reclassification

A similar case exists when a person fails to be promoted or reclassified, or misses out on higher duties.

These situations are always disappointing, and may need to be resolved through the industrial process. But they are not necessarily unlawful under the EO Act, even though they may sometimes be unfair.

If you would like to have a particular situation clarified in terms of the EO Act, please talk it over with the EEO Contact Officer in your work area, or the EEO Coordinator, Mr Steve Grasso on (09) 367 0363.

New book in production

The sequel to *Wild Places, Quiet Places, and North-West Bound* is now in the layout and design stages.

The book, tentatively titled *Wildflower Country*, will emphasise the region's flora and cover all national parks and other attractions from Jurien to Shark Bay and inland as far as Meekatharra.

Carolyn Thomson and John Hunter from Corporate Relations, who are editing the book, recently visited the Moora District to collate information.

District manager David Rose and ranger Keith Hocking showed them around Nambung National Park, Mount Lesueur and Stockyard Gully National Park.

The book should be ready for the 1991 wildflower season.

Corporate Relations Division is searching for photos of the parks and flora of the area. Anyone who has any good colour transparencies should contact Carolyn Thomson on (09) 389 8644.



Environment Minister Bob Pearce points out the Houtman Abrolhos Islands on one of the new information panels outside Geraldton's tourist bureau. Left to right are: Bob Pearce; Heather Taylor, General Manager of the Bill Sewell Complex; Pat Rowell, Senior Tourism Adviser; and Elaine Paterson, Chairperson of the Geraldton & Greenough Tourist Bureau and Promotional Directorate.

Minister opens shelter

Minister for the Environment Bob Pearce visited Geraldton recently to hand over a new information shelter to the local tourist bureau.

The interpretive panels contained in the new information shelter are an integral part of the overall interpretive plan for the Greenough and Gascoyne regions.

The shelter itself is located in front of the Geraldton Tourist Bureau's Sewell Complex and provides visitors and local people with detailed information on facilities and features in the region's national parks and marine

parks.

An allocation of \$9 000 from CALM's Park Improvement Fund was used to develop and implement the interpretive plan in Kalbarri National Park and the Geraldton Tourist Bureau.

Trailhead signs have been developed for the Murchison River Gorges at the Z-bend, the Loop, Hawks Head, Meanarra Hill overlooking Kalbarri and the Murchison River mouth, and Red Bluff at the head of the coastal gorges, south of the Kalbarri townsite.

The Mushroom Rock Nature Trail will have interpretive panels along its

route, a significant upgrading from the present brochure system.

A further \$45 000 of Park Improvement funding has been utilised to upgrade the Z-bend and Loop walk trails in the Kalbarri National Park.

Both walk trails are constructed using natural materials found in the area and the money has enabled five local people to be employed for a total of eight months.

In addition, four community based offenders were employed through the Department of Community Welfare, for a period of four weeks on walk trail

construction work, and the Department of Employment, Education and Training's three-month training program for people of Aboriginal descent provided one more person to assist with the construction work.

During his visit, Mr Pearce also took the opportunity to launch the new brochure on the Houtman Abrolhos Islands, jointly produced by CALM and the Abrolhos Island Consultative Council, and to present Dieback Resource Packages to students representing their local schools and colleges.

Cover for timber workers

Timber industry workers will now be covered by the Department of Occupational Health, Safety and Welfare's (DOHWSA) comprehensive inspection service. The change comes following DOHWSA's takeover of the administration of the Timber Industry Regulations Act and Regulations from CALM.

Occupational Health Safety and Welfare Commissioner Neil Bartholomaeus said the move had the support of both business and unions in the timber industry.

A working party of employer and union representatives has been set up to look at repealing any obsolete and outdated sections of the Timber Indus-

try Regulation Act and Regulations.

"The aim of the review of laws is to eventually repeal the Timber Industry Regulation Act and Regulations and incorporate relevant regulations for the timber industry under the Occupational Health, Safety and Welfare Act and Regulations applying to all workplaces," Mr Bartholomaeus said.

Mr Bartholomaeus said timber industry mill and forest workers had a relatively hazardous work environment and every effort would be made to build on the improvements that had occurred in recent years.

This effort would be based upon the best possible information from worker's compensation claims and with thorough consultation with timber industry employees and unions, he said.

"The current CALM inspectors have transferred to DOHWSA - two in Bunbury and one in Manjimup - and we have given an assurance that in replacing inspectors, we will look for people with specialist expertise in the timber industry."

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Sign of success

by Alan Sands

So successful has been the Theft Risk Area sign produced by CALM architectural draftsman Steve Csaba that it is now seen widely throughout the Perth metropolitan area.

Other agencies are using the sign at such places as Port Beach and Mersey Point.

Recreation and Landscape Branch was recently contacted by other government departments seeking permission to use the sign.

Steve attributes the sign's success to the comic character and the simple wording which is easily understood by both children and adults.

Steve was the driving

force behind CALM's sign manual, produced by Recreation and Landscape Branch in late 1989.

All departmental signs are now based on the detailed specification within the manual.

Like the Theft Risk Area, the sign manual has also travelled. It is now used widely throughout Australia, in a regional park in England, and copies have been sent for a tour of duty with a land management agency in Mexico.

To make life easier for field units, Steve organ-

ised a contract for all processed graphic signs. It's now a simple matter of ordering signs direct from the contractor.

"The purpose of the contract was to save time, effort and money, and to ensure that all departmental signs have a uniform style," he said.

The comprehensive contract was recently sent to all field units.



Trapping success

A census of Collie's wildlife is being carried out by forest officers there.

Brad Barton and Rob Brazell started monitoring the area's wildlife population late last year by setting traps and carrying out spotlight surveys at night.

The number of woylies captured during one trapping session indicated a rise in the endangered species population.

"We expect the woylies we are catching now are the remnant population from the woylie population released by the Forests Department research branch in this area in 1983," Mr Barton said.

"Signs that a numbat population may exist in the area have also prompted us to attempt a fox control program."

Dieback spreads

A number of access roads in Mt Lesueur have been closed to prevent the spread of dieback.

CALM Moora district manager David Rose said that two infections of *Phytophthora citricola* had been identified: one at the northern boundary of the area and one at the southern boundary.

"At this stage they are very small, but they have the potential to spread," he said.

Signs have been erected and a map will be produced of the area advising visitors where they can travel.

Ningaloo Reef wins award

Ningaloo Reef Marine Park has won an award for being one of Tourism's Outstanding Performers (TOP) in 1990.

Readers of the tourism magazine *Holiday Stopover* were asked to nominate businesses, individuals or attractions.

Winners were determined by the number of nominations received for the appropriate award.

Ningaloo is adjacent to Cape Range National Park and popular tourist destinations such as Coral Bay, Yardie Creek, Mandu Mandu Gorge and Mangrove Bay, and is a deserving winner.

Ningaloo reef, built from about 220 species of coral, is 260 kilometres long and forms a barrier protecting shallow sandy lagoons. It supports an amazing variety of over 500 species of fish.

The runner-up in the same category was another CALM area close to Ningaloo - Mount Augustus National Park.

They call it the diamond dove

A West German ornithologist is battling extreme temperatures, equipment breakdowns and flies in the Hamersley Range National Park so she can study the diamond dove.

Elke Schleucher from the Goethe University in Frankfurt is working towards her PhD in biology, specialising in zoology.

The diamond dove, one of the smallest members of the pigeon family, weighs

only 30 to 35 grams and is a common family pet in Germany.

Elke is interested in the dove because of its thermal regulation behaviour and its ability to live in arid environments.

Her study will also compare the characteristics of the dove's behaviour in the wild to those of birds in Germany.

Elke is tracking doves for up to 12 hours at a time, using a transmitter attached to the bird's tail and a receiver to monitor the environmental temperature.

She said that without the support of CALM, which has enabled her to stay in national park facilities, the study would not have been possible.

New information booklet

CALM's Human Resources Branch has produced a new employee information booklet.

The booklet is packed with information ranging from salaries and wages, safety in the workplace, equal employment opportunity and career advancement to practical information about using departmental vehicles and telephones.

"We now have something to hand out to new employees," said establishment officer Jan Sutton, "that advises them of what to expect working for CALM, gives them general information about their employment conditions and services and facilities such as superannuation."

Jan said that all CALM staff would receive a copy to keep on hand for when they need to refer to it.

A large number of CALM staff contributed to the book, writing sections on their field of expertise.

Rare fauna records

Within hours of implementing Katanning district's Rare Fauna Records System, its value was proven when a gypsum mining proposal was found to be in an area identified as containing a population of western whippbirds.

The district's system is being compiled in accordance with the strategies contained in Policy Statement no.33: Conservation of Endangered and Specially Protected Fauna in the Wild.

The system is in the same format as the established Rare Flora Records System and will be maintained on a parallel basis.

Flora find

A detour to find a shady tree under which to eat lunch resulted in the discovery of two new declared rare flora populations by senior reserves officer Mal Graham recently.

The find, near Lake Lockhart, of *Acacia lanuginosa* was significant in that the only previously known population consists of only nine plants in an area subject to encroaching salinity in close proximity to a road and a railway line.

The other species found, *Eremophila serpens*, is known to invade disturbed areas and its rarity status is presently under review.