



**MINING
REHABILITATION**



RECREATION

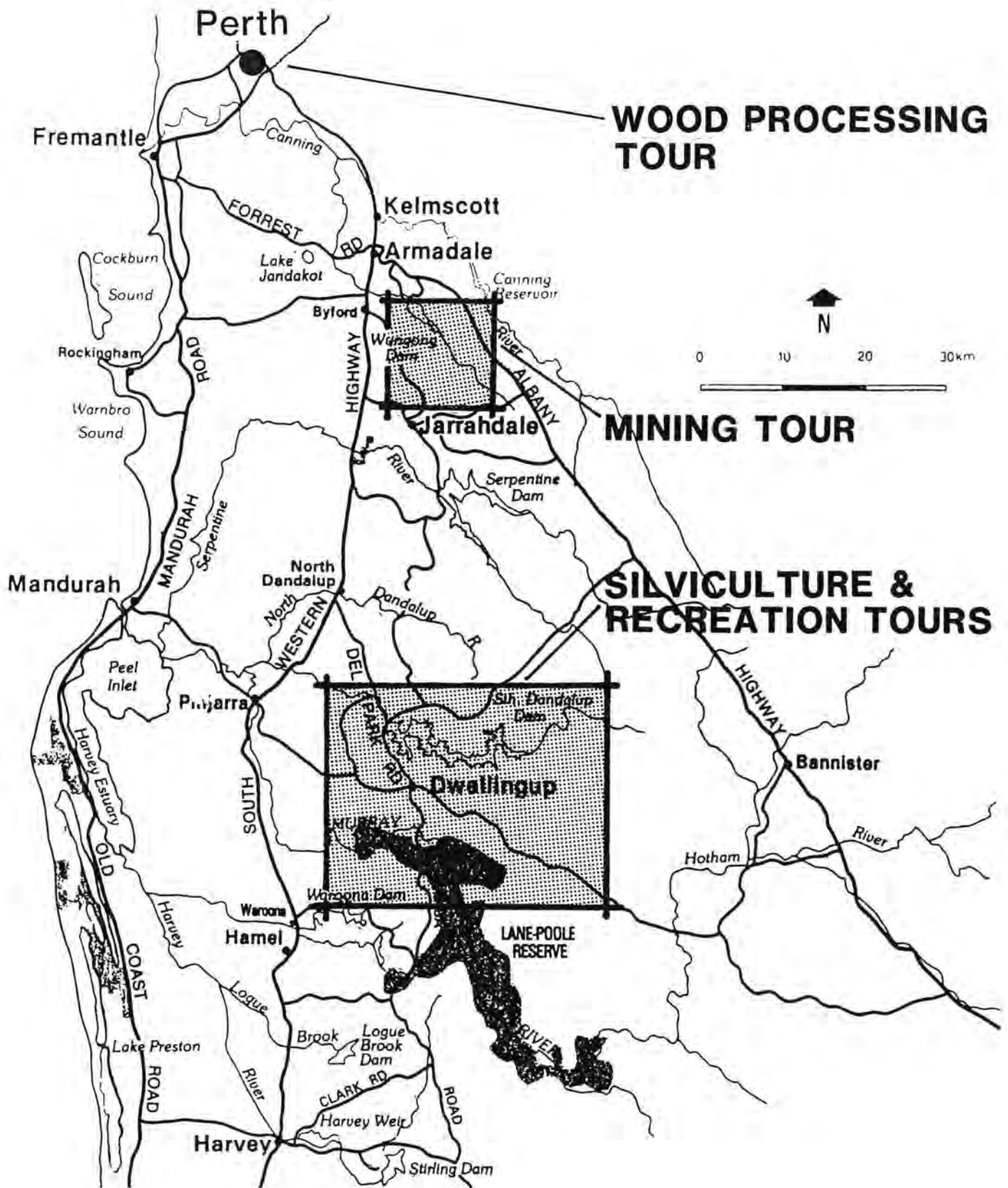
**WOOD AND
WATER**



**WOOD
PROCESSING**



**I.F.A. BIENNIAL CONFERENCE 1987
MID-CONFERENCE TECHNICAL TOURS**



**LOCALITY MAP
MID-CONFERENCE TECHNICAL TOURS**



MINING REHABILITATION

BAUXITE MINING REHABILITATION

Tour Theme: Alcoa of Australia Limited began bauxite mining in the Darling Range in 1963. Annual production is now 17 million tonnes, which involves clearing 300-350ha annually. Mineable quality bauxite covers less than 5% of the total jarrah forest region. Current operations are located in areas of particularly good bauxite development and occupy about 30% of the landscape.

The objective of present rehabilitation of mined areas is to regenerate a stable forest ecosystem capable of replacing the function of the original forest system. Development of appropriate rehabilitation techniques has been an evolutionary process. Researchers and operational personnel from both Alcoa and CALM have contributed to the many improvements in techniques used by Alcoa during the last 24 years of mining. Jarrahdale was the first of Alcoa's four minesites. The evolution of mining and rehabilitation philosophies and techniques are well illustrated at this minesite and will be discussed during the day.

TIME	ITINERARY/COMMENTS
0800	Depart Parmelia.
0800-0930	Travel to Jarrahdale via Freeway, Nicholson Road, Southwest Highway and Nettleton Road.
0930	STOP 1. VANTAGE POINT OFF HAUL ROAD I
	The overall scene will be set here with a discussion on land use of the Northern jarrah forest with particular emphasis on bauxite mining its significance and relationship to other land uses.
1000	STOP 2. OPERATING MINE PIT
	This stop will provide an opportunity to see how bauxite is mined. The geology of the region will be explained and a typical upland jarrah soil profile exposed.
1030-1045	Travel to the No. 1 mine site at Langford Park. At the turn off to Langford Park is site 3 marked on your map. We will not be stopping at this site, however it is worth noting as some of the better jarrah forest we will be passing on the tour.
1045-1145	STOP 4. EARLY REHABILITATION NO. 1 SITE.
	The classic features of a very early rehabilitated mine pit are well illustrated at these stops. The scale of the mining operation and the objectives for rehabilitation during this period will be discussed.
	You will be given the opportunity to walk along a CALM designed walk track where important aspects of the sites are described. This track leads to the lunch spot.
1145-1230	STOP 5. LUNCH AT LANGFORD PARK.
	This particular picnic spot was developed around a water hole created during the mining operation.
1230-1245	Travel to "Jungle plot" in No. 2 mine site.

TIME	ITINERARY/COMMENTS
1245-1330	<p>STOP 7. JUNGLE PLOT 1970'2 REHABILITATION.</p> <p>Discussion will focus on the advances in rehabilitation during the 1970's with regard to:</p> <ul style="list-style-type: none"> - landscaping - deep ripping - understorey revegetation - water management - species selection. <p>Also at this site you will be given an opportunity to walk through the Jungle plot and experience the extremes of understorey revegetation. The fire control implications of this regeneration technique will also be discussed.</p> <p>Note: Stops 6 & 7 had to be combined to cut the tour length down.</p>
1330-1345	Travel to Stop 8.
1345-1430	<p>STOP 8. HAUL ROAD 2 MINING AND DIEBACK</p> <p>Jarrah dieback is the name of the disease caused by the introduced soil borne fungus <u>Phytophthora cinnamomi</u>. This disease is distributed widely throughout the jarrah forest. Mining and rehabilitation operations have been developed to minimise the spread and intensification of the disease. Treatments have also been designed, in co-operation with CALM to:</p> <ol style="list-style-type: none"> 1) rehabilitate dieback affected areas near Alcoa's mine pits, and 2) increase the resistance of healthy sites to the disease. <p>This stop will show sites with a range of disease impact. Researchers will discuss the nature of the disease and its management in relation to mining and rehabilitation.</p>
1430-1440	Travel to Stop 9.

TIME	ITINERARY/COMMENTS
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1440-1600	STOP 9. THE MOUNTAIN, 1980's REHABILITATION.
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This site was rehabilitated in 1982 and shows a range of aspects of the present day rehabilitation prescriptions. Discussions will focus on these prescriptions and the performance and success of the rehabilitation. Time will be available at this site to walk through the rehabilitation and to have a cup of Billy tea. CALM and Alcoa's staff will be available at this site to answer any questions you might have on matters raised during the tour.

1600	RETURN TO PERTH.
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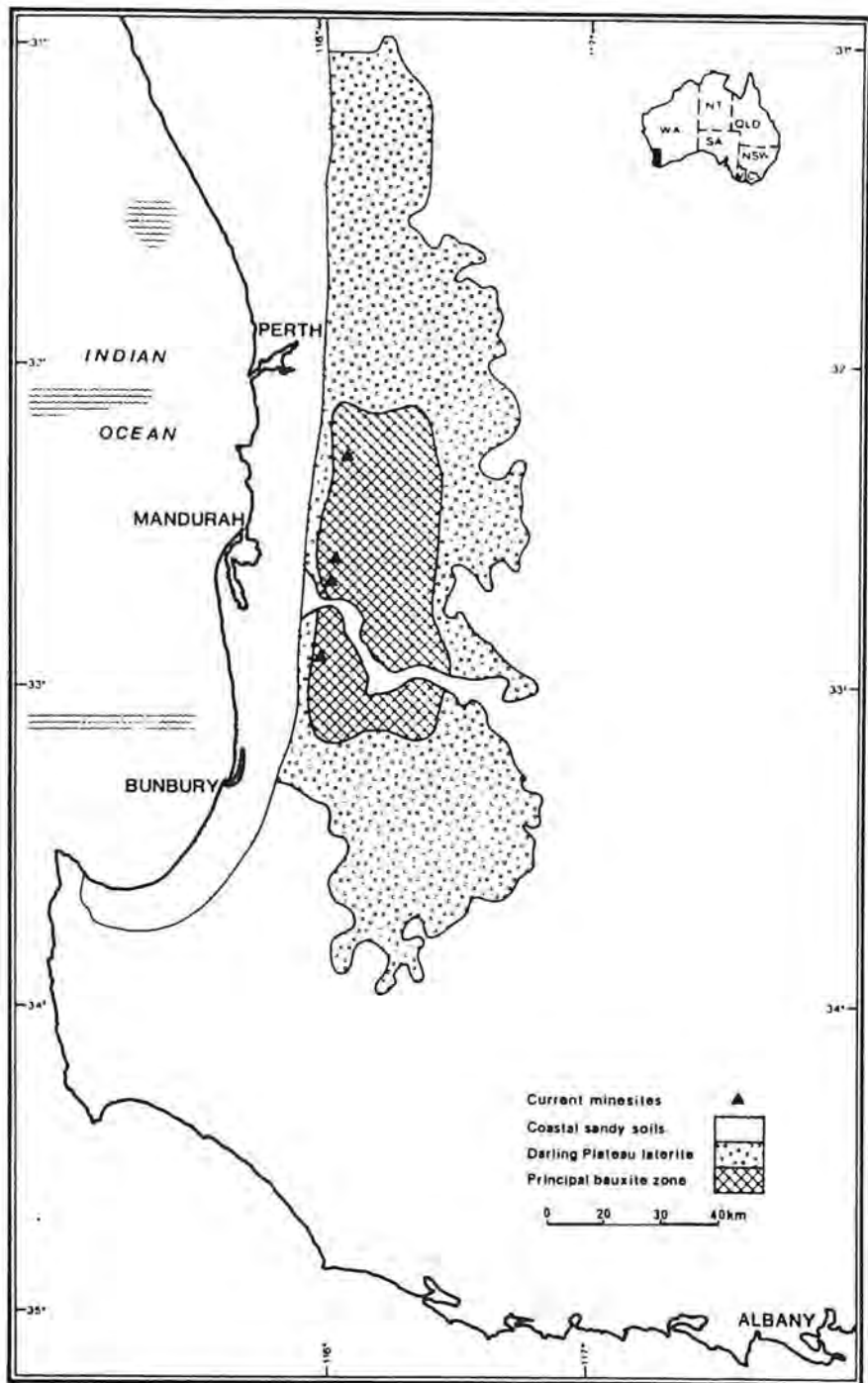
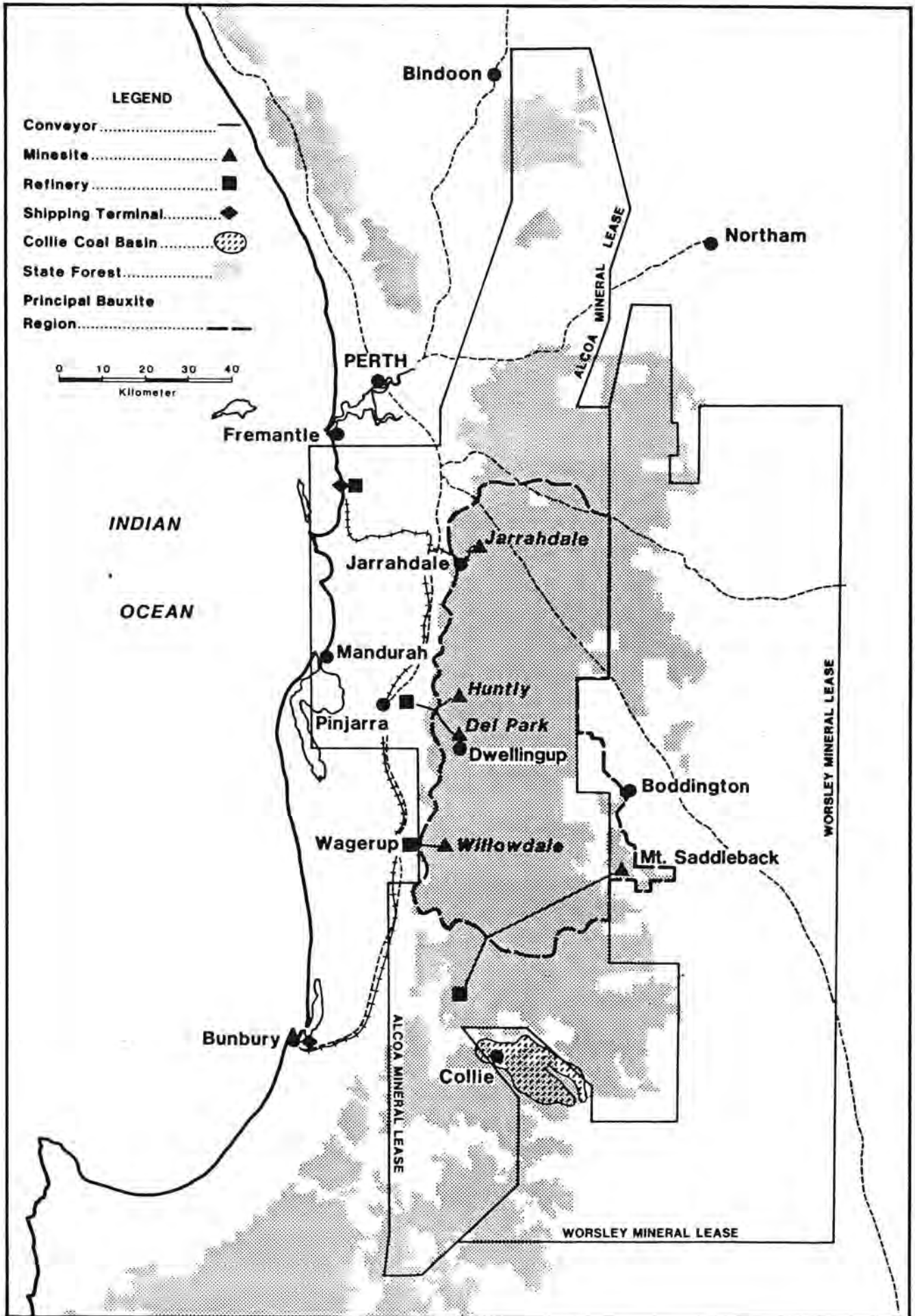
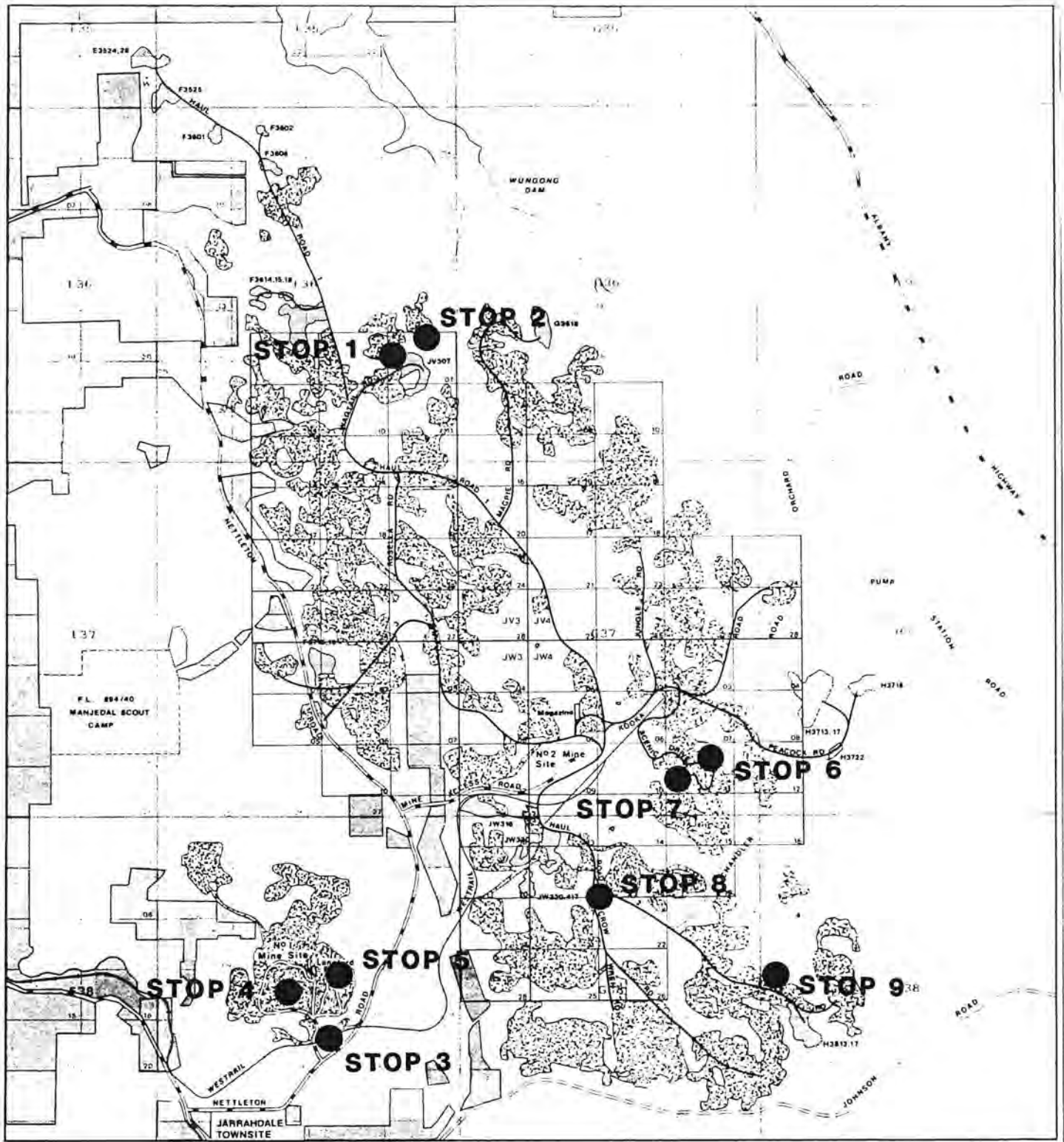
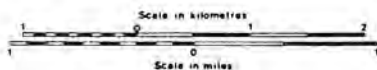


Fig. 1. Soil types and location of minesites in south-western Australia.



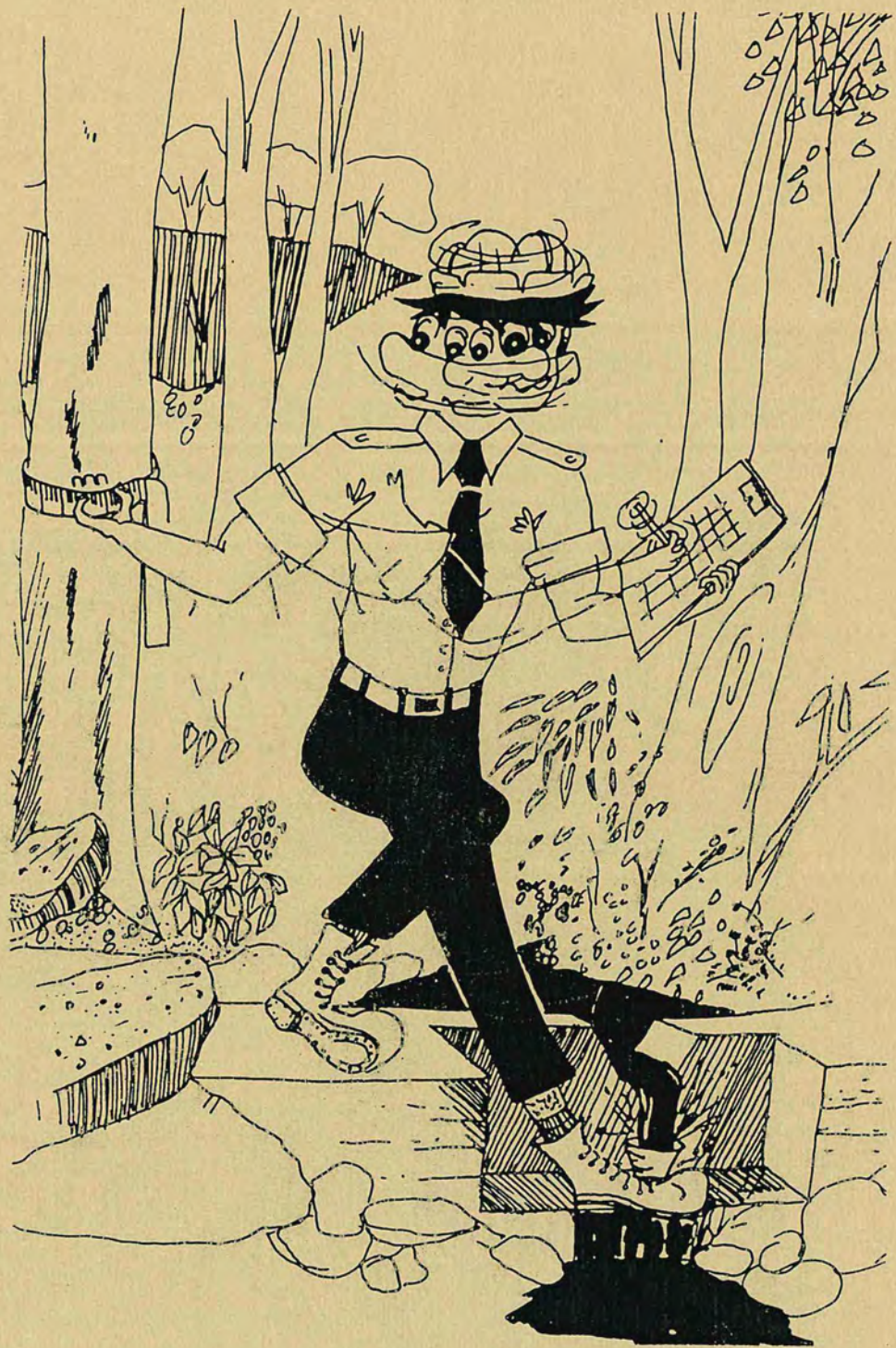


- Haul roads
- Public roads
- Area cleared for mining
- Rehabilitated areas
- Private property
- Imperial mining sheet layout
- Metric mining sheet layout



ALCOA OF AUSTRALIA LIMITED
 JARRAHDALE MINING AREA

BAUXITE MINING REHABILITATION TOUR



**WOOD AND
WATER**

JARRAH SILVICULTURE FOR WATER AND WOOD PRODUCTION

Tour Theme: the Northern Jarrah forest must supply many products to the large populous area of Perth immediately adjacent to it. This tour looks at forest management for two of the traditional uses, jarrah sawlogs and water.

Arguably the most valuable product from the Northern Jarrah forest, water must be supplied in increasing quantities to satisfy the growth of Perth. As the cost of harnessing supplies further from Perth rises and the quality of water deteriorates due to salination the prospect of boosting run off from the fresh western forest catchments becomes more attractive.

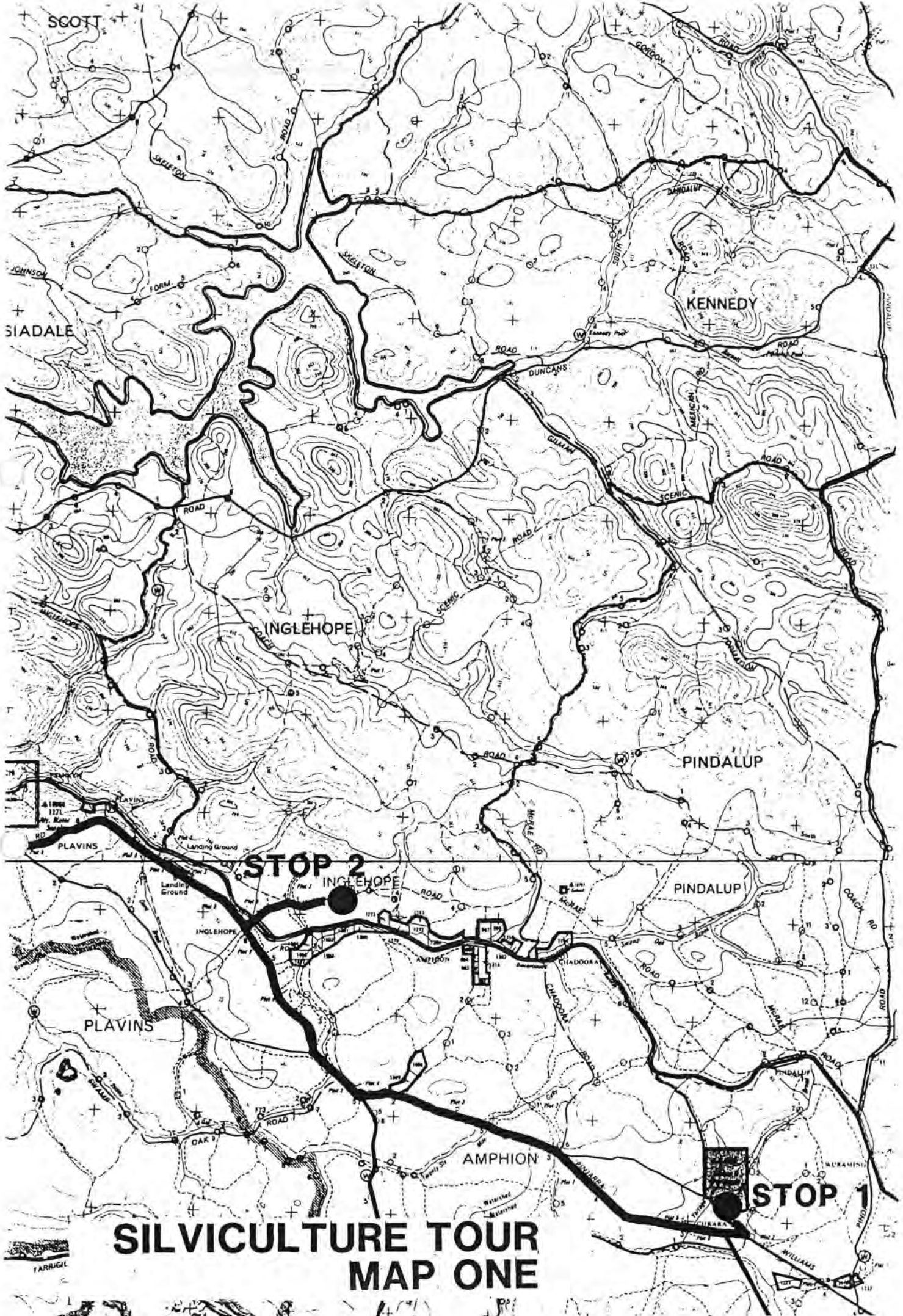
It is possible that the twin objectives of water and wood production are highly compatible. This tour will demonstrate the silvicultural requirements for cutting in jarrah old growth, the thinning response capable and how this is being extended to promote water production.

Tour Location: the tour will be centered around the jarrah forest close to Dwellingup a large part of which is on the catchment of the South Dandalup dam, a major water supply for Perth.

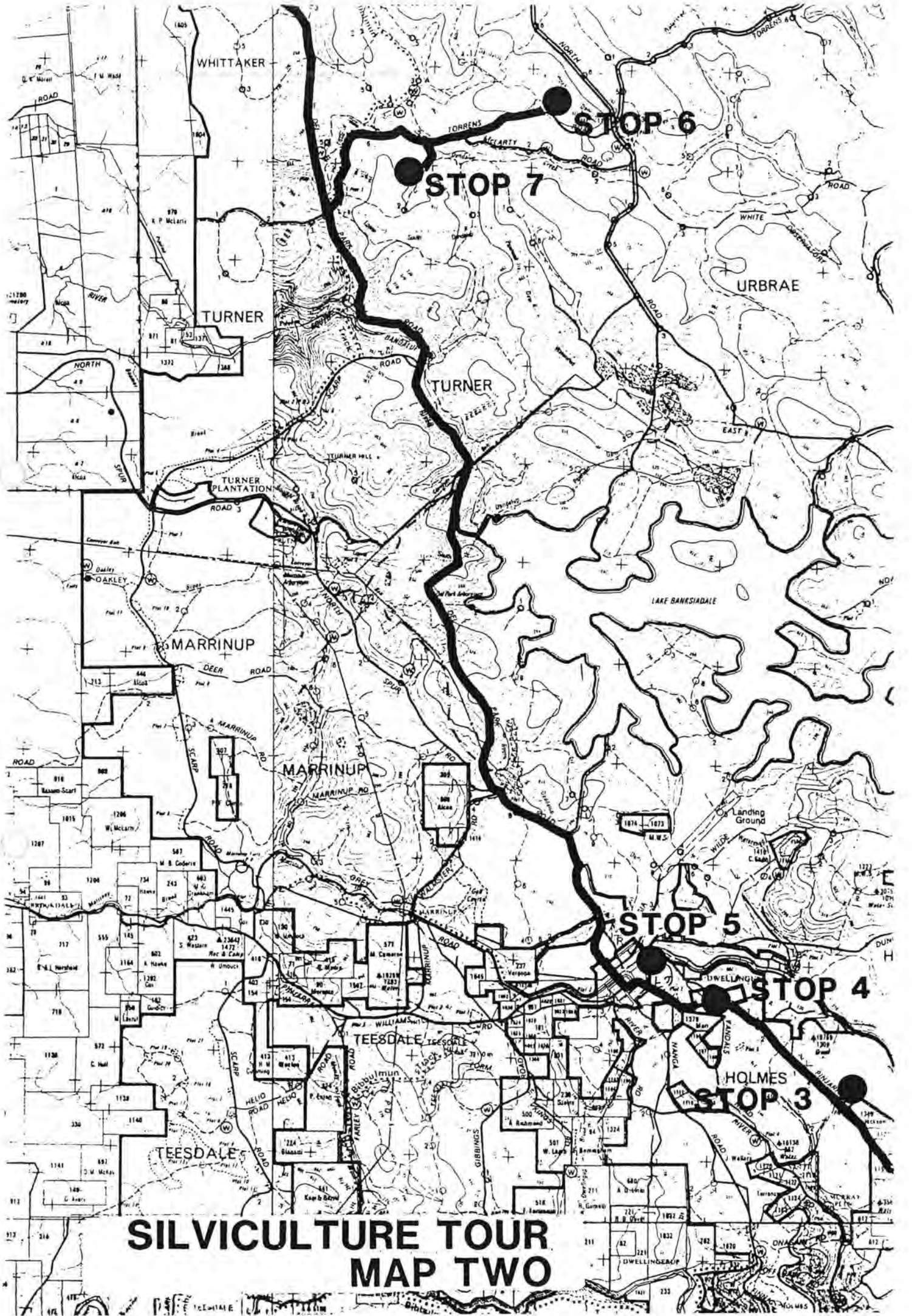
TIME	ITINERARY/COMMENTS
0800	<p>From Perth down the southwest highway to North Dandalup.</p> <p>Introduction to the tour on the bus by outlining:</p> <ul style="list-style-type: none"> - the extent of the jarrah forest; - the history of timber production and the current and predicted extent of the cut; - land use in the northern jarrah forest and the conflicts caused by competing uses. <p>From North Dandalup south east along Del Park road to the South Dandalup Dam.</p> <p>A rest stop here.</p> <p>From the South Dandalup down through Dwellingup along the Williams road to reserve A 4596 at Curara.</p> <p>On this section of the trip discuss:</p> <ul style="list-style-type: none"> - the importance of the area for water; - the west to east hydrological gradients; - salinity problems; - the effect on land use.
1000	<p>STOP 1 A 4596 CURARA (includes morning tea)</p> <p>The reserve is a small patch of virgin forest in the midst of adjacent cutting of approximately 60 years ago.</p> <p>This stop will be used to demonstrate:</p> <ul style="list-style-type: none"> - stages of jarrah regeneration; - forest structure; - natural regeneration patterns; - the silvicultural practice for this type of forest and the adjacent pole stand.

TIME	ITINERARY/COMMENTS
1050	<p>Travel back along the Williams road to the Inglehope thinning plots. Enroute discuss:</p> <ul style="list-style-type: none"> - the cause of and extent of jarrah dieback; - severity of disease impact according to environmental conditions; - operational constraints to minimise spread.
1105	<p>STOP 2 INGLEHOPE THINNING PLOTS</p> <p>This series of thinning plots areas originally put in 1964 in a 40 year old jarrah pole stand. The plots have been monitored continuously and have recently been rethinned. This stop will demonstrate</p> <ul style="list-style-type: none"> - tree and stand response to various levels of thinning; - the utilisation problems in thinning; - the current research project at the site.
1145	<p>Travel further back along the Williams road towards Dwellingup to the Holmes thinning area.</p>
1200	<p>STOP 3 HOLMES THINNING AREA</p> <p>This stop extends the knowledge of the thinning trials into the operational area. Here a series of plots demonstrate thinning at various levels of utilisation and follow up non-commercial silvicultural operations.</p>
1230	<p>Continue back up the Williams road to Dwellingup to the cemetery.</p>
1235	<p>STOP 4 CEMETRY SITE</p> <p>This site demonstrates jarrah forest with inadequate regeneration vectors present. Points to be discussed:</p> <ul style="list-style-type: none"> - the mixed structure and compositions of this type of forest; - the status of the regeneration; - the reasons for development of this type of forest;

TIME	ITINERARY/COMMENTS
	<ul style="list-style-type: none"> - the silvicultural systems for forest with inadequate regeneration.
1255	Travel into Dwellingup for lunch.
1300	STOP 5 LUNCH - HOTHAM VALLEY RAILWAY LUNCH SITE
	A barbeque lunch will be cooked.
1400	Travel North West back along Del Park road then Torrens road to the Hansen catchment.
1430	STOP 6 HANSEN CATCHMENT
	This catchment was thinned heavily in 1986 after a 9 year calibration period. To be discussed at this point:
	<ul style="list-style-type: none"> - silviculture for water production and the differences to wood production; - areas suitable for such treatment; - catchment research results; - estimates of stream flow increases; - potential increases to water supply system yield.
1500	Travel west back along Torrens road to Warren catchment.
1510	STOP 7 WARREN CATCHMENT (including afternoon tea)
	The Warren catchment is the opposite side of the coin to the Hansen catchment. Severely degraded by dieback the site warrants rehabilitation but is a high water yielding site because of the lack of vegetation. After 8 years of calibration this catchment was rehabilitated with eucalypts and acacias.
	To be discussed at this site:
	<ul style="list-style-type: none"> - the contribution of present degraded areas to water supply; - the likely effect of rehabilitation.
1600	Return to Perth.



SILVICULTURE TOUR MAP ONE



SILVICULTURE TOUR MAP TWO



RECREATION

RECREATION

Tour Theme: this tour will focus on the various recreation planning strategies and management programmes employed in an area of native forest subject to increasing land use demands and conflicts. In particular, the tour will:

- . outline the Department of Conservation and Land Management's responsibilities, role and approach to forest land use planning in general and recreation planning in particular (as illustrated by the Lane Poole Reserve);
- . discuss the policies and strategies being used to accommodate recreational use in forested water catchments used for domestic supply;
- . inspect recreation site development and visitor control measures designed to accommodate increasing visitor use while safeguarding resource values;
- . look at the involvement of private landowners and special interest groups in providing for public recreation opportunities;
- . inspect the rehabilitation of landscapes disturbed as a result of dieback and mining and how they can be used for recreation.

Most importantly, the tour will provide a forum for the interchange of ideas and experiences among resource managers involved or interested in forest recreation planning and management.

Tour Location: the tour will be centered around Dwellingup and the western third of the Lane Poole Reserve and Marrinup and South Dandalup drainages northwest of Dwellingup.

TIME	ITINERARY/COMMENTS
0800	Tour departure from hotel.
0800-0930	Travel to the South Dandalup Dam via the Kwinana Freeway, South Street, Nicholson Road to Serpentine and then via the Southwest Highway and Del Park Road; commentary on the various land use patterns, the Metropolitan Region Corridor Plan and major landscape features (Darling scarp, wetlands, etc) geomorphology and vegetation to be provided in transit.
0930-0945	<p>STOP 1 SOUTH DANDALUP DAM (includes morning tea)</p> <ul style="list-style-type: none"> <li>. Outline of tour objectives and programme (W Schmidt). <li>. Introduction of discussion leaders (W Schmidt). <li>. Briefing on District-Regional context, size, staffing levels, operations, etc with particular emphasis on recreation management (K Vear).
0945-1015	<p>Planning overview (J Williamson).</p> <ul style="list-style-type: none"> <li>. Regional land use demands (Northern Jarrah Forest) and the role of planning in resolving conflicts; reference to Forests Department, General Working Plan and Regional L.V.M.P. <li>. CALM"s role/legislative responsibility in resource planning with specific reference to recreation planning. <li>. Types of plans. <li>. Planning approaches and procedures (project team approach, public participation, etc). <li>. Current forest land use planning and management issues with specific reference to the recreational use of catchment areas.
1030-1100	<p>Recreation and Catchment Management.</p> <ul style="list-style-type: none"> <li>. Regional perspective on water resources and the importance of water in the Northern Jarrah Forest (B Fleay and J Williamson).

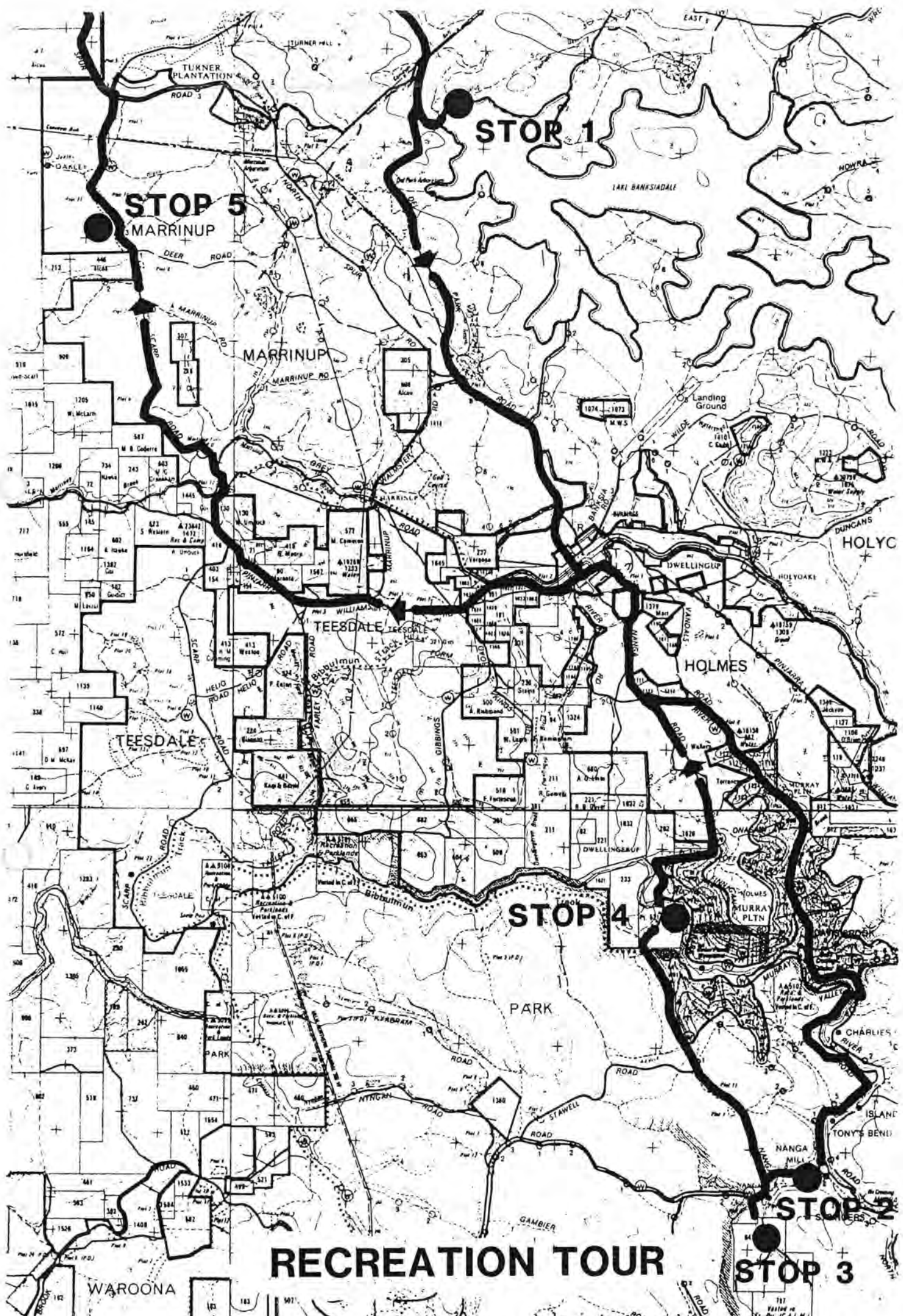
- . Overview of Water Authority's role/responsibilities in catchment management and current policies governing recreational use (F Fleay).
 - . Recent catchment planning and management initiatives ... eg. Water Resources Council's Working Party on Recreation in Catchments; Canning Catchment Management Plan; Waroona and Logue Brook Plan; Marrinup Forest Tour projects, etc (B Fleay).
- 1100-1130 Travel to Lane Poole Reserve and Nanga Millsite via Dwellingup. Enroute discuss the history of Dwellingup and other Mill towns.
- 1130-1200 STOP 2 NANGA MILLSITE, LANE POOLE RESERVE
- . Orientation to Reserve and site.
- Lane Poole Reserve Management Plan (O Nichols).
- . Background to management plan - negotiations which preceded and led to establishment of the Reserve; formation of Reserve Advisory Committee and appointment of Planning Coordinator and Project Team.
 - . Overview of management plan - planning issues and objectives; planning process with specific reference to public participation program.
 - . Planning outcomes - how successful has the plan been in resolving issues and meeting needs of various interests.
- 1200-1215 Recreation Planning : Visitor's Persepctive (J Sharp).
- . Who are our users? ... a profile of visitor needs and expectations.
 - . Department plans and recreation policies ... how effective are they in meeting user needs (with specific reference to the Lane Poole Plan).
- 1215-1230 Recreation Planning : The Manager's Perspective (W Schmidt).
- . Overview of visitor use pressures within the Reserve from the late 1960's onward.
 - . Recreation development and resource protection initiatives (S.E.R.P.A. & C.E.P. projects).

- . The "recreation succession" treadmill - setting limits of acceptable change.
- 1230-1330 LUNCH NANGA MILLSITE
- 1330-1335 Travel to Icy Creek Camp
- 1335-1415 STOP 3 & 4 ICY CREEK CAMP AND NANGA BUSH CAMP, LANE POOLE RESERVE
- Forest Camps - their role in community recreation and education.
- . Icy Creek project - concept and background to development program; intended users, prior use of site and purchase arrangements (K Vear).
 - . Site Planning objectives and outline of development program; inspection of site (R Hammond).
 - . Use of Icy Creek facility; development of educational programs and materials with reference to other CALM centres such as Jarrahdale and Perup (Gil Field).
- 1430-1500 The Role of Private Enterprise - the Nanga Bush Camp Model (G Bell).
- . Background to camp development - owner objectives and marketing strategies.
 - . Camp facilities and operations.
 - . Camp clientele.
 - . Role of private enterprise in servicing public recreation needs.
 - . Resource management and protection responsibilities - scope for public/private cooperation (inspect river bank rehabilitation and development work).
- 1500-1515 Afternoon tea and damper at Nanga Bush Camp.
- 1515-1545 Travel to Scarp Road dieback site via Marrinup Forest tour route; commentary in transit on dieback and mining rehabilitation programs.
- 1545-1615 STOP 5 SCARP ROAD DIEBACK AREA
- Recreational use of disturbed landscapes. This stop will be preceded by an en-route discussion of bauxite mining and rehabilitation operations including description of the FIRS programme (O Nichols).

- . Overview of dieback management - nature and scale of problems, research directions and current rehabilitation prescriptions (O Nichols).
- . Implications for recreation and landscape management with reference to Marrinup Forest Tour project; inspection of Dieback Interpretation Trail (W Schmidt).

1615-1730

Return to Perth via Refinery Road and Southwestern Highway.



STOP 1

STOP 5
MARRINUP

STOP 4

STOP 2

STOP 3

RECREATION TOUR

WAROONA

HOLYOAKE

HOLMES

PARK

RANGA MILL

ISLAND

TONY'S BEND

CHARLIES RIVER

MURRAY PLTN

DUNCANS

HOLYOAKE

HOLYOAKE

HOLYOAKE

HOLYOAKE

HOLYOAKE

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WOOD PROCESSING

WOOD PROCESSING FACILITIES

Tour Theme: CALM in its recently released Draft Timber Strategy put great emphasis on the need to use native hardwoods for value added uses rather than have it put on the green sawn market.

Local companies such as the ones we will be visiting today, Bunnings and Wesfi, have been moving in this direction for some time. Bunnings for example now put more than 50% of the sawn jarrah out put into value added processing compared to 10% 10 years ago.

This tour will look at the flow of wood through the processing facilities and the machinery and techniques used to obtain the desired products.

TIME	ITINERARY/COMMENTS
0900	Depart Parmelia for Bunnings Welshpool.
0930	STOP 1 - BUNNINGS WELSHPOOL.
0930-1000	Morning tea with Introduction.
1000-1200	<p>Inspect Facilities.</p> <p>The tour will follow the flow of wood through the plant to the various end uses. Also illustrated will be the process whereby off cuts, rejects etc. are picked up and processed into saleable products. Operations to be inspected include:</p>
	<p>Veneer plant High speed pre-dressing machines Mouldings Finger jointing Glulam production Parquetry Garden furniture.</p>
1200-1300	LUNCH
1300-1315	Travel to Wesfi, Victoria Park.
1315-1500	<p>Inspect facilities.</p> <p>This plant concentrates on the production of panel products. Illustrated will be</p> <p>rotary peeling of exotic and local woods; flitch slicing of exotic and local woods; veneer preparation; plywood manufacture; pressing of veneers onto panel board.</p>
1500-1530	Afternoon tea.
1530	Depart Wesfi.
1600	Arrive back at Parmelia.