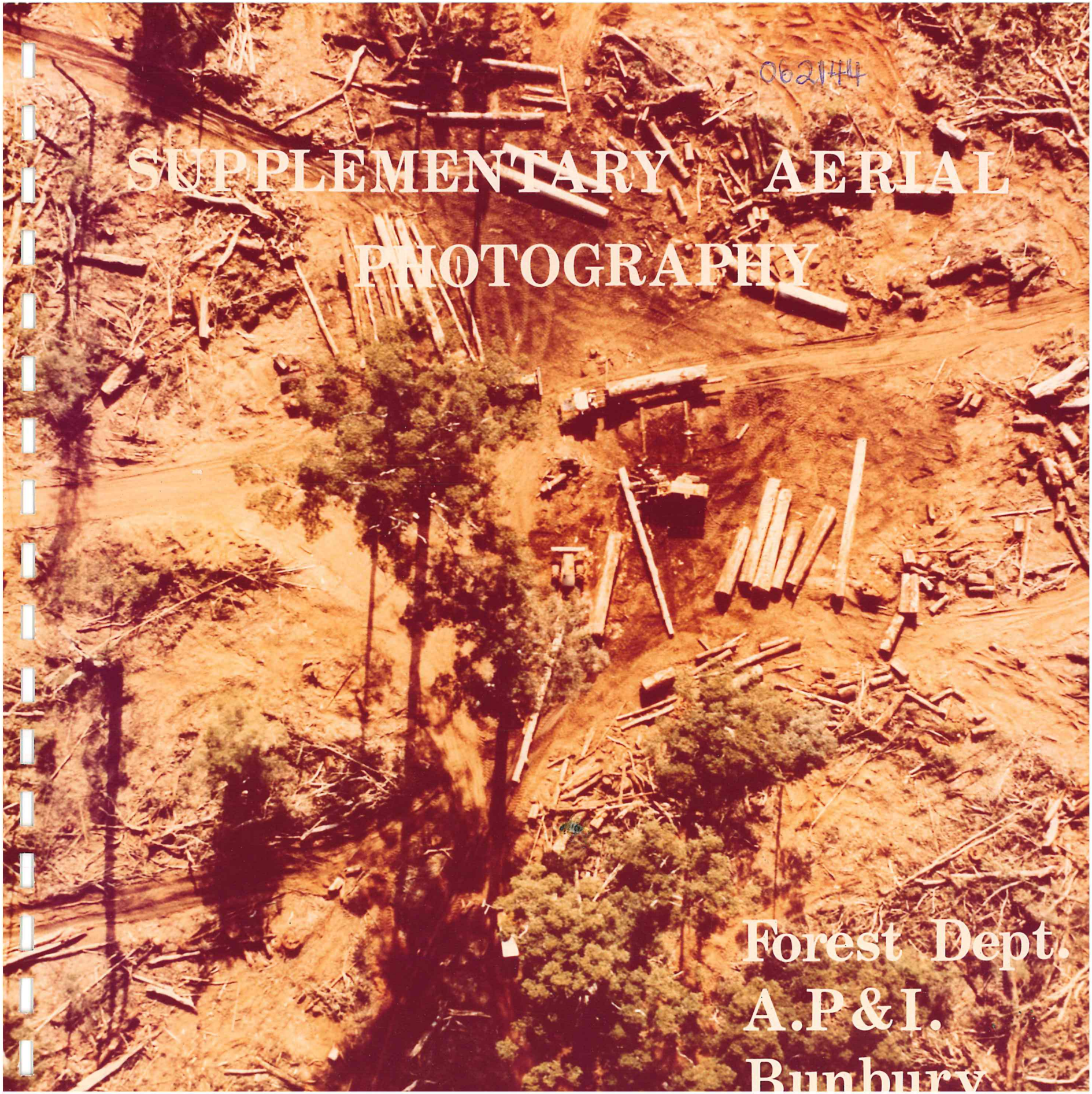
SUPPLEMENTARY AERIAL PHOTOGRAPHY



Forest Dept.
A.P&I.
Bunbury

C O N T E N T S

FRONT COVER

Karri logging operation, Warren Coupe 6. Detailing landing and loading of Karri sawlogs.

1. INTRODUCTION

Aerial Photography is a valuable tool for any land manager, as it provides a pictorial record at a given point in time of the status of the environment.

This folio is presented to provide forest managers with an insight into the attributes of the Supplementary Aerial Photography (S.A.P.)system, and how it may be used by them.

The S.A.P. system was developed by the Forests Department's Aerial Photography and Interpretation (A.P.& I.) Section,to compliment aerial photography available from the Lands and Surveys Department.

It is able to provide large scale (high detail) and medium scale (lesser detail) photographs that are not readily available from Lands and Surveys Department.

This also enables updating of information gained from existing Lands and Surveys Department Photography.

The photography can be done at short notice, if required, and is relatively inexpensive.

The folio covers a number of areas to ensure users are able to take full advantage of S.A.P.

These areas are:

(a) Film type - the range available and when each should be used.

(b) Scale showing the range of detail provided at a number of levels.

Some of the existing uses of S.A.P. are then shown, indicating present areas of use, and to stimulate ideas on possible future areas of application in forest management.

The final section covers the limitation of S.A.P., how to order photographs and the costs involved.

2. FILM TYPES

Four film types are currently used by the A.P.& I. Section for acquisition of aerial photography.

2.1 Panchromatic (Black and White)

2.2 Colour - negative (Prints)

2.3 Colour Infra-red (C.I.R.) (Transparencies/Prints)

2.4 Colour - Positive (Transparencies)

Purists for many years promoted the argument that panchromatic film for use in aerial photography is superior to its colour counterparts. Unfortunately the basis for this statement is somewhat doubtful when we consider the average observer can discriminate approximately five million colours and about two hundred shades of grey. Thus we can expect a colour presentation to be of value for analytical purposes even if the colours are not true to life because of the greater number of discernable levels available.

Therefore, when considering a film type for aerial photography, careful evaluation of the subject and the information required from the photograph must be made. While, as already discussed, colour may yield significant advantages, the increased acquisition and printing costs may not be warranted if the photograph is required for coupe demarcation.

2.1 Panchromatic (Black and White)

Panchromatic films are popular for aerial photography because its sensitivity extends from the blue to the red portion of the spectrum. Also there is a greater latitude in exposure and processing of Black and White panchromatic films than there is with colour films. This ensures a greater chance of success in every mission.

Processing and printing of Black and White films are carried out by A.P.& I. staff, this enables a quick turn around time and availability of prints at low unit cost.

Forests Dept. Aerial Photography Group Bunbury

LOCATION		SUBJECT	Date of Photography	Roll	Altitude	SCALE:	
				88/84	10000'	Nominal 1 : 19000	↑N
Block	Coupe		14/3/84	Frame	Lens	Actual	
BEAVIS	2			16	40mm		

2.2 Colour Film

Colour aerial photography entails the taking of aerial photographs in natural colour. Both colour negative and colour positive type films are available. Colour photography requires above average conditions (minimal haze), meticulous care in exposure, processing and colour-corrected lenses. High quality aerial photography in colour is possible and practical whenever the necessary expense and awaiting of favourable weather conditions is warranted.

Colour prints can be produced from either negative or positive films dependent on the initial requirement for photography. It is however, recommended that when colour prints are specifically required, negative film should be selected to avoid the additional cost and loss of resolution in producing the inter-negatives required to print colour positive films.

Cost is a serious consideration when planning missions using colour photography and prints. The cost of producing a single colour print (25cm x 25cm)ranges from $5.00 to $12.00 dependent on the quality control specified. Since all colour processing and printing is contracted out, payment is met by the Section requesting the photography (The cost of processing and printing Black and White photographs is met under A.P.& I.'s budget allocation).

Forests Dept. Aerial Photography Group Bunbury

LOCATION		SUBJECT	Date of Photography	Roll	Altitude	SCALE:	Nominal 1:19,000	↑
Block	Coupe			Frame	Lens		Actual	
BEAVIS	2		14·3·84		40mm			

2.3 Colour Infra Red (C.I.R.)

Colour infra red photographic emulsions are sensitised to record mostly in the near infra red portion of the spectrum. But as they also have some sensitivity to blue and green, the camera is usually equipped with either a deep red filter which passes only red rays, or with a minus blue filter to eliminate blue from the haze. Because the greens are recorded as reds on this emulsion, it is often termed 'false-colour film'. It is used in the detection of diseased plants and trees, identification of a variety of fresh and salt water growths for wetlands studies, and many pollution and environmental studies.

An examination of the previous colour print and C.I.R. print opposite, displays how the burning intensity both in and around Beavis 2 can be more easily evaluated using the C.I.R. compared to the colour print.

Forests Dept. Aerial Photography Group Bunbury

LOCATION	SUBJECT	Date of Photography	Roll	Altitude	SCALE:	
			9/84	10,000'	Nominal	
Block BEAVIS Coupe 2		14-3-84	Frame	Lens	Actual	

2.4 Colour Positive Transparencies

These are recommended when the user requests a large number of colour photographs with no requirement for either enlargements or prints from the photographs initially.

Colour positive transparencies can significantly reduce the cost of colour photography, as a transparency can be produced for approximately $0.50 to $1.00 per frame.

One limiting feature with the use of transparencies is the need to be viewed either by projection (70mm projector)or over a light table. This can prove inconvenient if the user does not have access to either.

In most cases colour transparencies are produced stereoscopically and viewed through a stereoscope which allows magnification of the image up to four times.

2.4.1 Stereo Photography

Stereo photography is used to produce a three dimensional visual model. This can be applied in three ways:

(a) As an interpretation aid in recognizing objects.
(b) Estimation of slope or relative heights.
(c) Accurately measure height differences.

Stereo photography can be reproduced with any of the film types shown, and is not restricted to colour positive transparencies as shown opposite.
NB: A stereoscope should be used to view the frames opposite to appreciate the effects of stereoscopic vision.

Forests Dept. Aerial Photography Group Bunbury

LOCATION	SUBJECT	Date of Photography	Roll	Altitude	SCALE: Nominal	
Block Coupe			Frame	Lens	Actual	

3. Scale

3. SCALE

It is important to know the amount of detail visible on a photograph over the range of scales available. This will enable the correct scale with the appropriate amount of detail to be selected for any photograph you may require.

The following seven photographs are taken over the same area but vary in scale from 1:25 000 to 1:1 500. The area covered varies from 4 000m x 4 000m (1 600ha.) to 300m x 300m (9 ha.).

The changes in scale were achieved by three different methods:

(a) different enlargements of the same negative eg. Photographs 3.1 and 3.2.
(b) using different lenses at the same height eg. Photographs 3.2, 3.3, and 3.4.
(c) using the same lens at different heights eg. Photographs 3.4, 3.5, 3.6 and 3.7.

3.1 Actual Scale 1:25 000 Area Covered - 4 000m x 4 000m (1 600 ha.)

(a) 40mm lens at 10 000 feet A.G.L. (3050m)
(b) actual scale prints are produced to allow accurate updating of logging records by Southern Region I.& P.
(c) the scale was determined by projecting the negative on to 1:25 000 map and determining the required enlargement before printing the photograph.

The following six prints are produced at a Nominal scale; where no allowance is made for small variations in flying height or topography. They are approximate scales.

Forests Dept. Aerial Photography Group Bunbury

LOCATION	SUBJECT	Date of Photography	Roll	Altitude	SCALE: Nominal	1 N
Block BEAVIS Coupe 2		14/3/84	88/84 Frame 16	10 000' Lens 40mm	Actual 1 : 25000	

3.2 Nominal Scale 1:19 000 Area Covered 4 000m x 4 000m (1 600 ha.)

(a) 40mm lens at 10 000 feet A.G.L. (3050m)

(b) the negative had a Contact scale of 1:75 000 and it was enlarged four times to give a Nominal scale of 1:19 000.

(c) this lens and altitude is used for Southern Region Hardwood logging control and pine plantation monitoring where maximum coverage is required.

(d) the 40mm lens is not recommended for large scale photography due to the radical displacement produced.

Forests Dept. Aerial Photography Group Bunbury

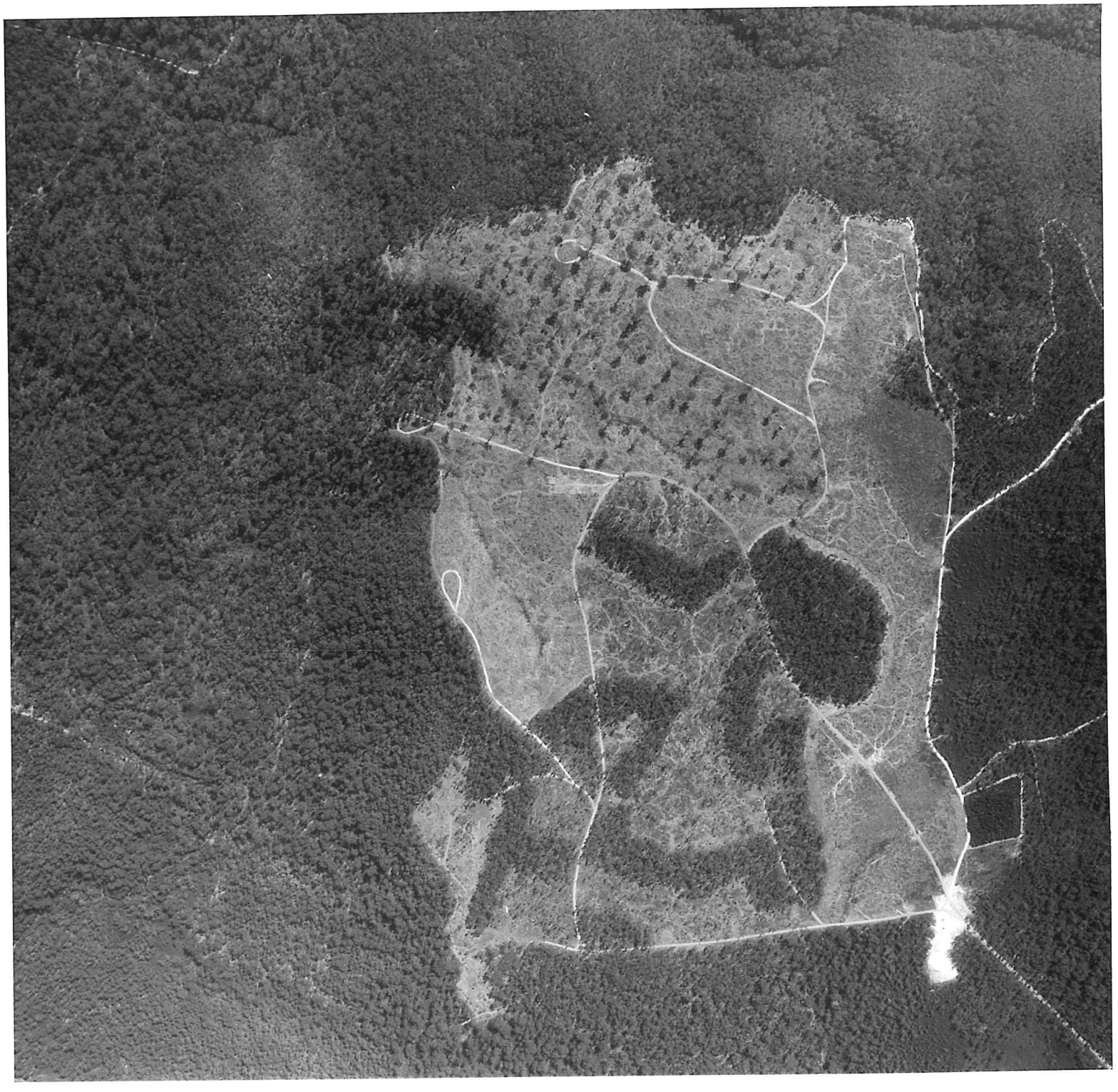
LOCATION		SUBJECT	Date of Photography	Roll	Altitude	SCALE	Nominal 1:19000	N
Block	Coupe			Frame	Lens		Actual	
BEAVIS	2		14/3/84	16	40mm			

Roll 88/84 Altitude 10 000'

3.3 Nominal Scale 1:13 000 Area Covered 2 800m x 2 800m (800 ha.)

(a) 60mm lens at 10 000 feet A.G.L.

(b) used when a slightly larger scale print is required.



Forests Dept. Aerial Photography Group Bunbury

LOCATION	SUBJECT	Date of Photography	Roll	Altitude	SCALE		
			88/84	10000'	..	Nominal 1:13000	1N
Block BEAUIS Coupe 2		14/3/84	Frame 6	Lens 60mm		Actual	

3.4 Nominal Scale 1:9 500 Area Covered 2 000m x 2 000m (400ha.)

(a) 80mm lens at 10 000 feet A.G.L.

(b) this lens is not normally used at 10 000 feet.

(c) the lens is usually used for large scale photography where reduced radial displacement is required. Eg. Research, Landscape Planning.

Forests Dept. Aerial Photography Group Bunbury

LOCATION	SUBJECT	Date of Photography	Roll	Altitude	SCALE:		
			88/84	10 000'		Nominal 1 : 9500	1/N
Block BEAUIS Coupe 2		14/3/84	Frame 10	Lens 80mm		Actual	

3.5 Nominal Scale 1:5 000 Area Covered 1 000m x 1 000m (100ha.)

(a) 80mm lens at 5 000 feet.

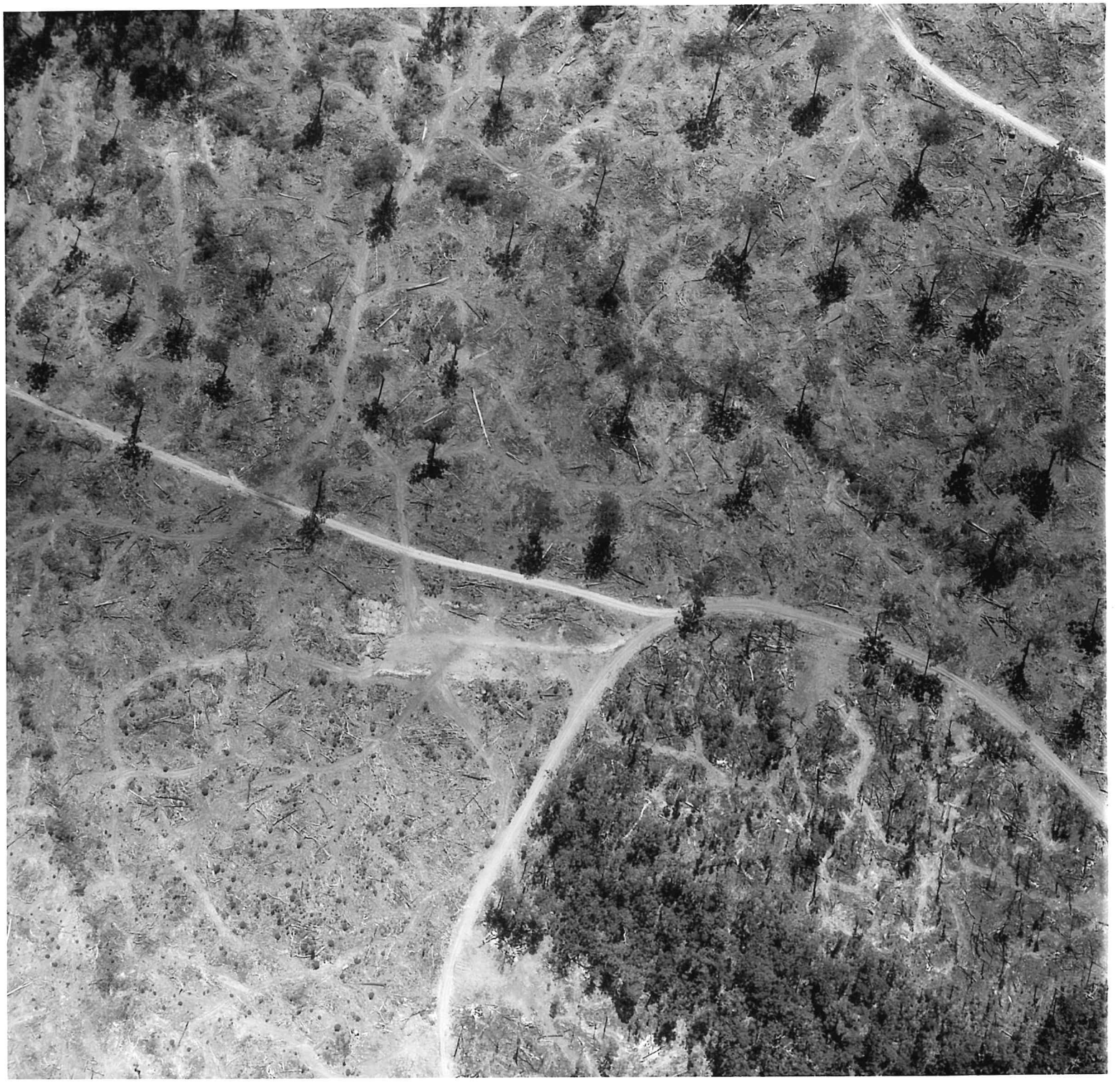
(b) the flying height with the 80mm lens will usually depend on the subject size, to ensure the whole subject is covered.

Forests Dept. Aerial Photography Group Bunbury

LOCATION		SUBJECT	Date of Photography	Roll	Altitude	SCALE		
Block	Coupe						Nominal 1:5000	1 N
BEAUIS	2		14/3/84	88/84 Frame 25	5000' Lens 80mm		Actual	

3.6 Nominal Scale 1:3 000 Area Covered 600m x 600m (36 ha.)

(a) 80mm lens at 3 000 feet.



Forests Dept. Aerial Photography Group Bunbury

LOCATION		SUBJECT	Date of Photography	Roll	Altitude	SCALE		
Block	Coupe			88/84	3000'	.. Nominal	1 : 3000	1 N
BEAVIS	2		14/3/84	Frame 30	Lens 80mm	Actual		

3.7 Nominal Scale 1.1 500 Area Covered 300m x 300m (9 ha.)

(a) 80mm lens at 1,500 feet.

(b) very effective for micro catchment mapping when done in stereo.

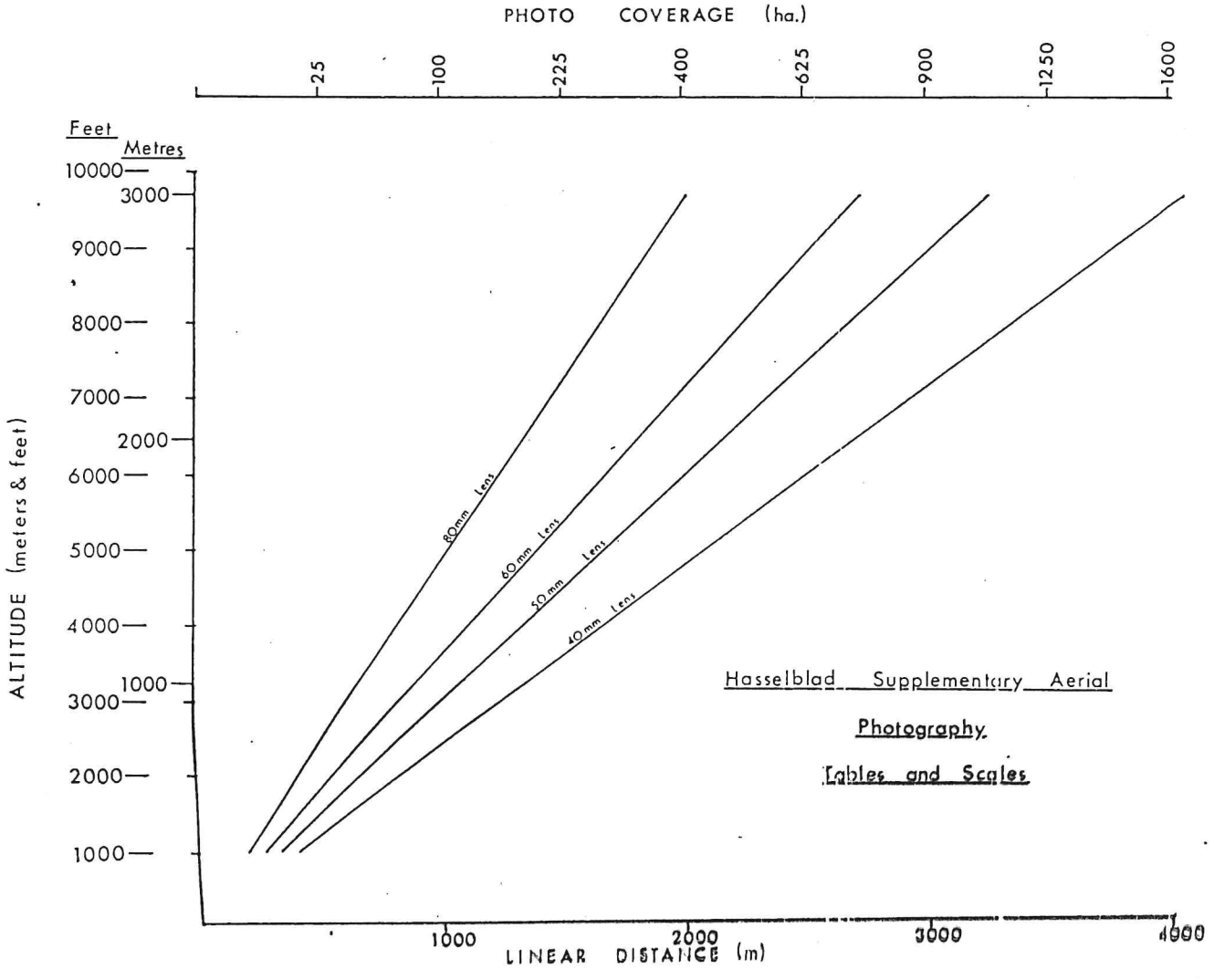
(c) larger scales can be produced if required.

Forests Dept. Aerial Photography Group Bunbury

LOCATION	SUBJECT	Date of Photography	Roll	Altitude	SCALE:		
			88/84	1500'		Nominal 1:1500	1/N
Block: BEAVIS Coupe: 2		14/3/84	Frame: 35	Lens: 80mm		Actual	

3.8 Hasselblad Supplementary Aerial Photography Tables and Scales

The graph below shows the relationship between Altitude, Photo Coverage, Linear distance (distance across the negative) and Contact Scale (scale of the negative). This is shown for each lens - 40, 50, 60 and 80mm.
For example: Using the 40mm lens at 10 000 feet will give a photo coverage of 1 600 ha.; a Linear Distance of 4 000m and a Contact Scale of 1:75 000.
When the negative is enlarged five times (to make a 25cm x 25cm photo) the scale of the photo will be $5 \times \frac{1}{75\ 000} = 1:15\ 000$.



CONTACT SCALE			
40 mm	50 mm	60mm	80mm
75000	60000	50000	37500
70000	56000	46000	35000
60000	48000	40000	30000
50000	40000	33330	25000
40000	32000	26660	20000
30000	24000	20000	15000
20000	16000	13330	10000
10000	8000	6660	5000
5000	4000	3330	2500

4. PHOTOGRAPH PAPER TYPES

There are two paper types suitable for printing aerial photographs, semi-matt and gloss. To allow a direct comparison, only half the semi-matt print is shown.

Semi-matt prints are usually produced when photographs are to be used in the field as reflection is reduced compared to gloss prints.

Gloss is usually used when photographs are to be used in the office and for all enlargements over 25cm x 25cm.

Forests Dept. Aerial Pho Photography Group Bunbury

LOCATION	SUBJECT	Date of Photography	Roll	ll	Altitude	SCALE: Nominal 1:9500	
Block BEAUIS Coupe 2		14/3/84	Frame	3/84 ame 10	10 000' Lens 80mm	Actual	N

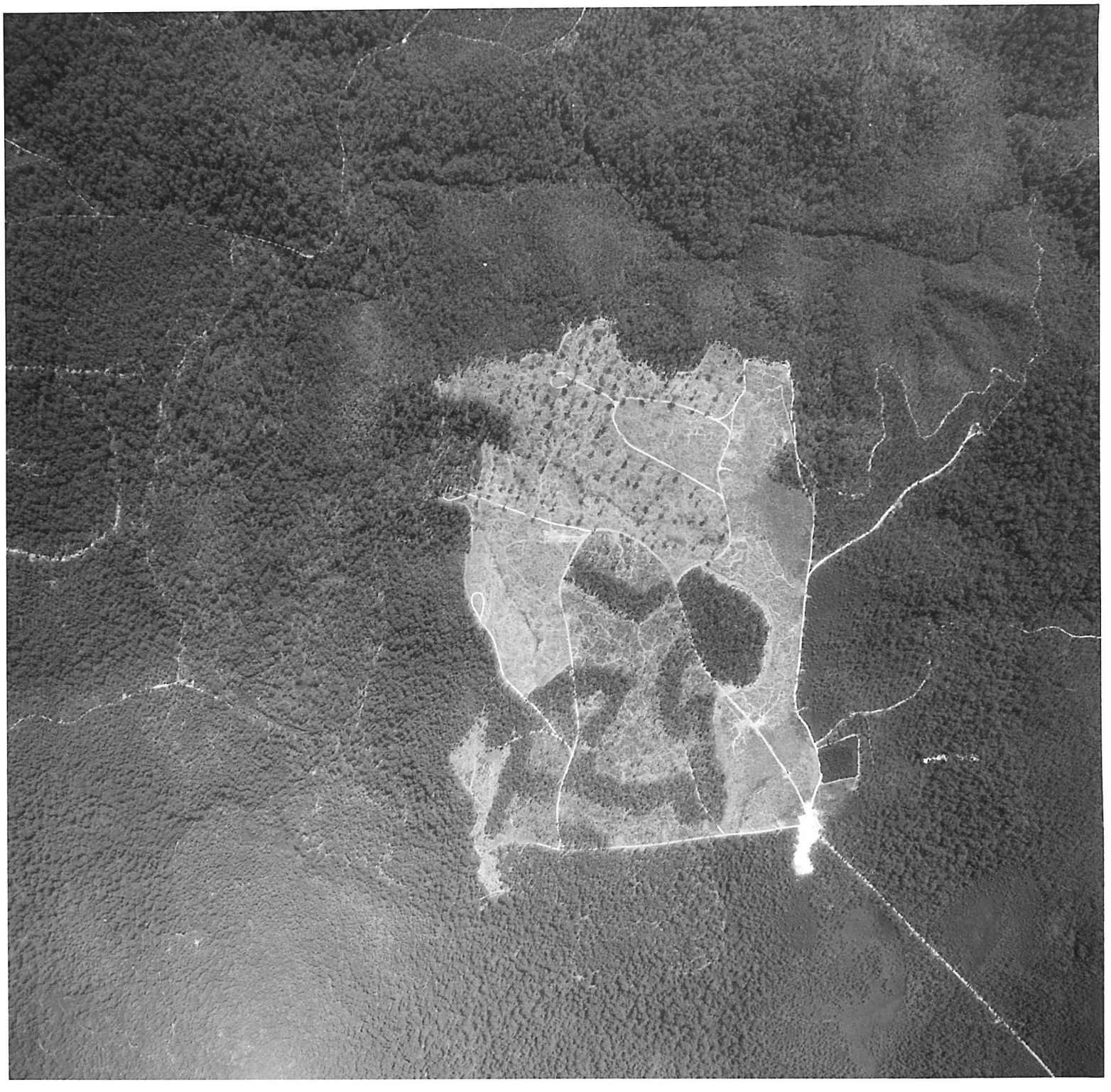
5. EXISTING SUPPLEMENTARY USES

The photographs in this section show some of the many uses of Supplementary Aerial Photography.

A wide range of subjects are shown to indicate where aerial photography can be of use to the forest manager.

5.1

The first four photographs show the logging history of Beavis 2 over the period 1982-84. Photography is used on all phases of logging in the Southern Region and for all the updating of logging records.



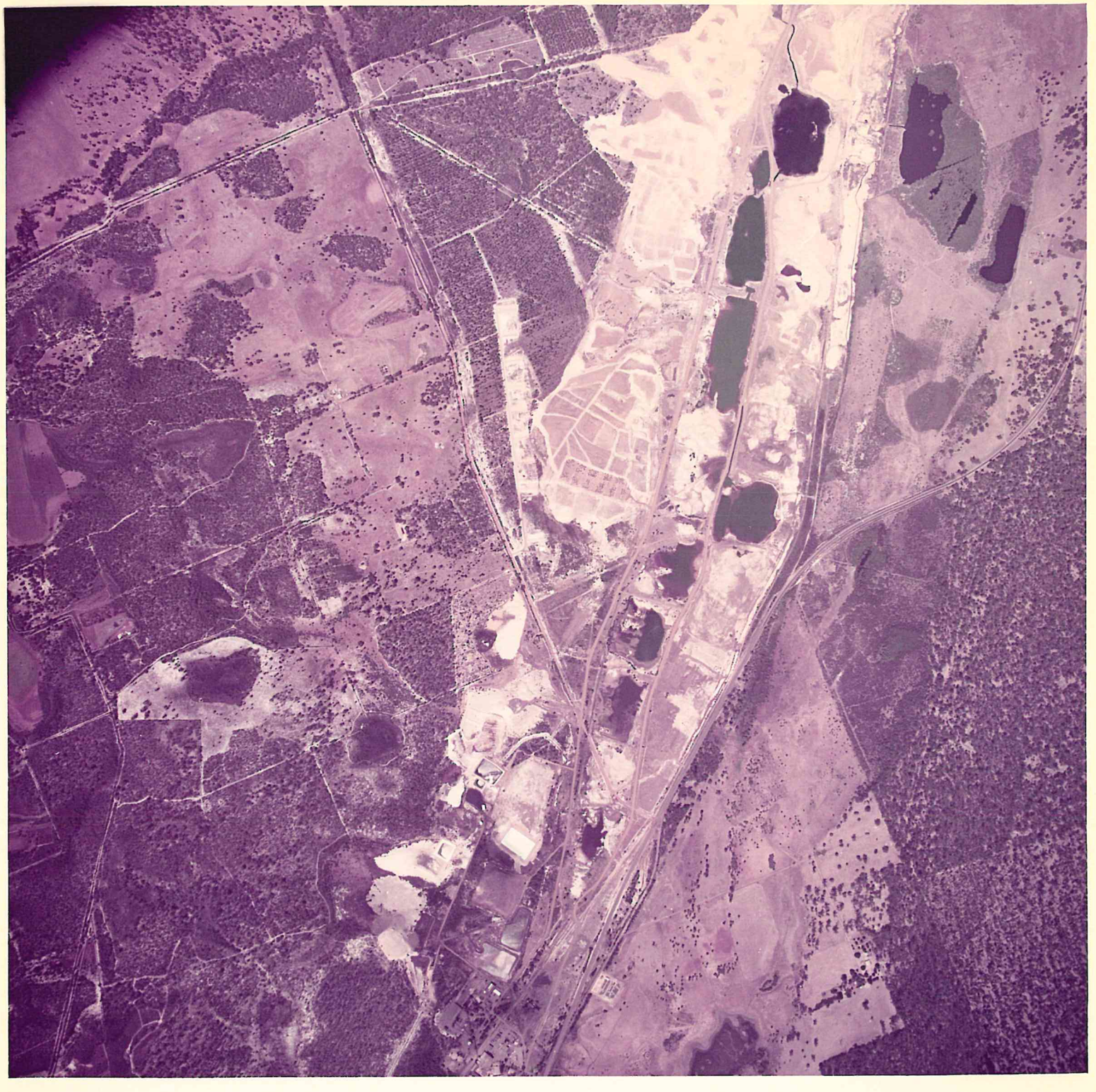
Forests Dept. Aerial Photography Group Bunbury

LOCATION		SUBJECT	Date of Photography	Roll	Altitude	SCALE:	
Block	Coupe					Nominal	1:19000
BEAUIS	2		14/3/84	Frame 16	Lens 40mm	Actual	N

5.2 Capel Mineral Sand Mining

Purpose: Photograph used to delineate mining and areas to be rehabilitated.

Specification: 40mm lens at 10 000 feet. Area covered 1 600 ha.



Forests Dept. Aerial Photography Group Bunbury

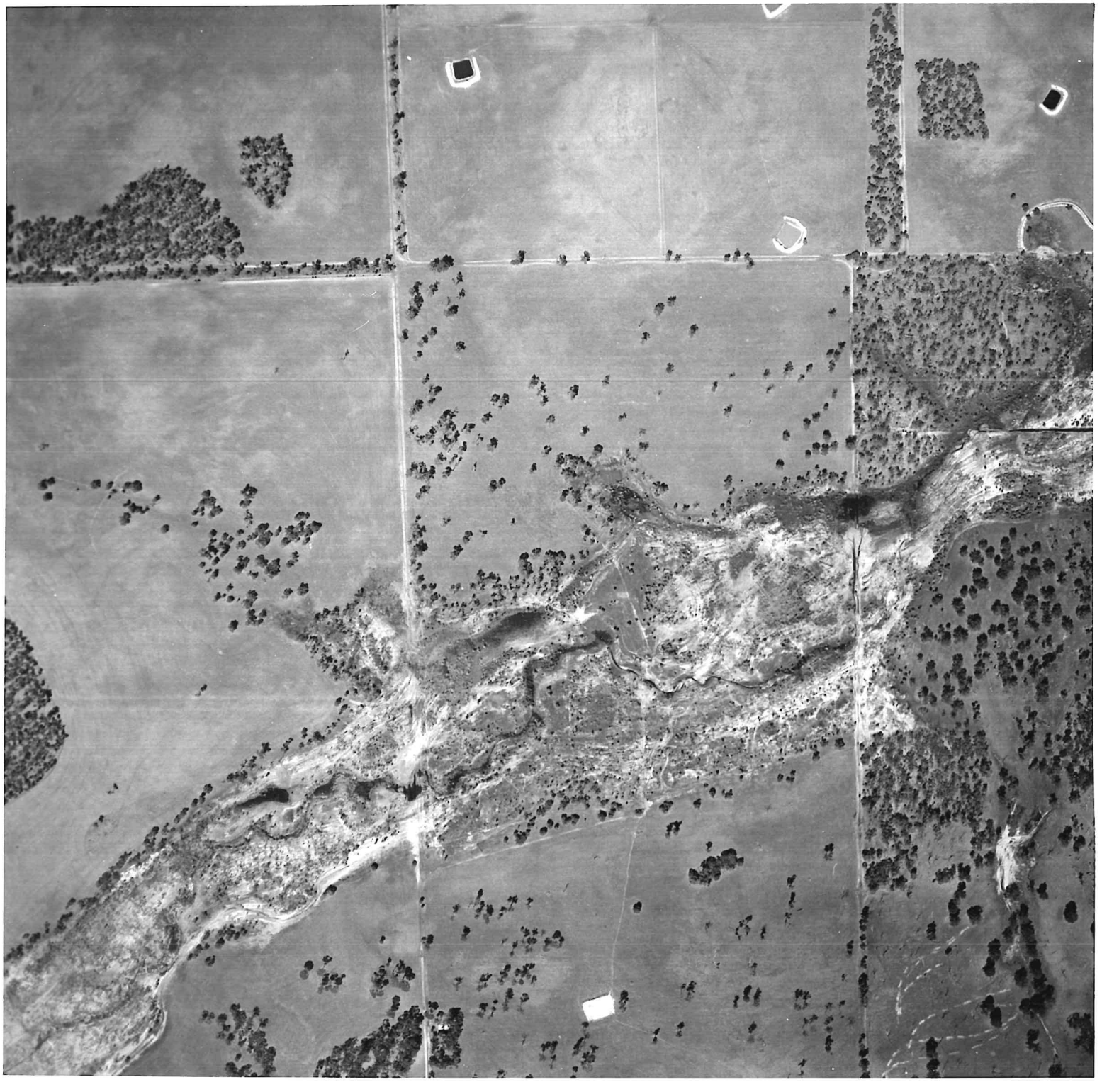
LOCATION	SUBJECT	Date of Photography	Roll/SP	Altitude	SCALE.. Nominal 1:18,000	
CAPEL	MINERAL SAND MINING	27-1-83	1/83	10,000'		N
Block Coupe			Frame 10	Lens 40mm	Actual	

5.3 P.W.D. Reforestation Tenderden

Location: N.E. Mt Barker.

Purpose: salt evaluation and preparation for reforestation on private property in the Kent River catchment.

Specification: 40mm lens at 6 000 feet. Area Covered 400 ha.



Forests Dept. Aerial Photography Group Bunbury

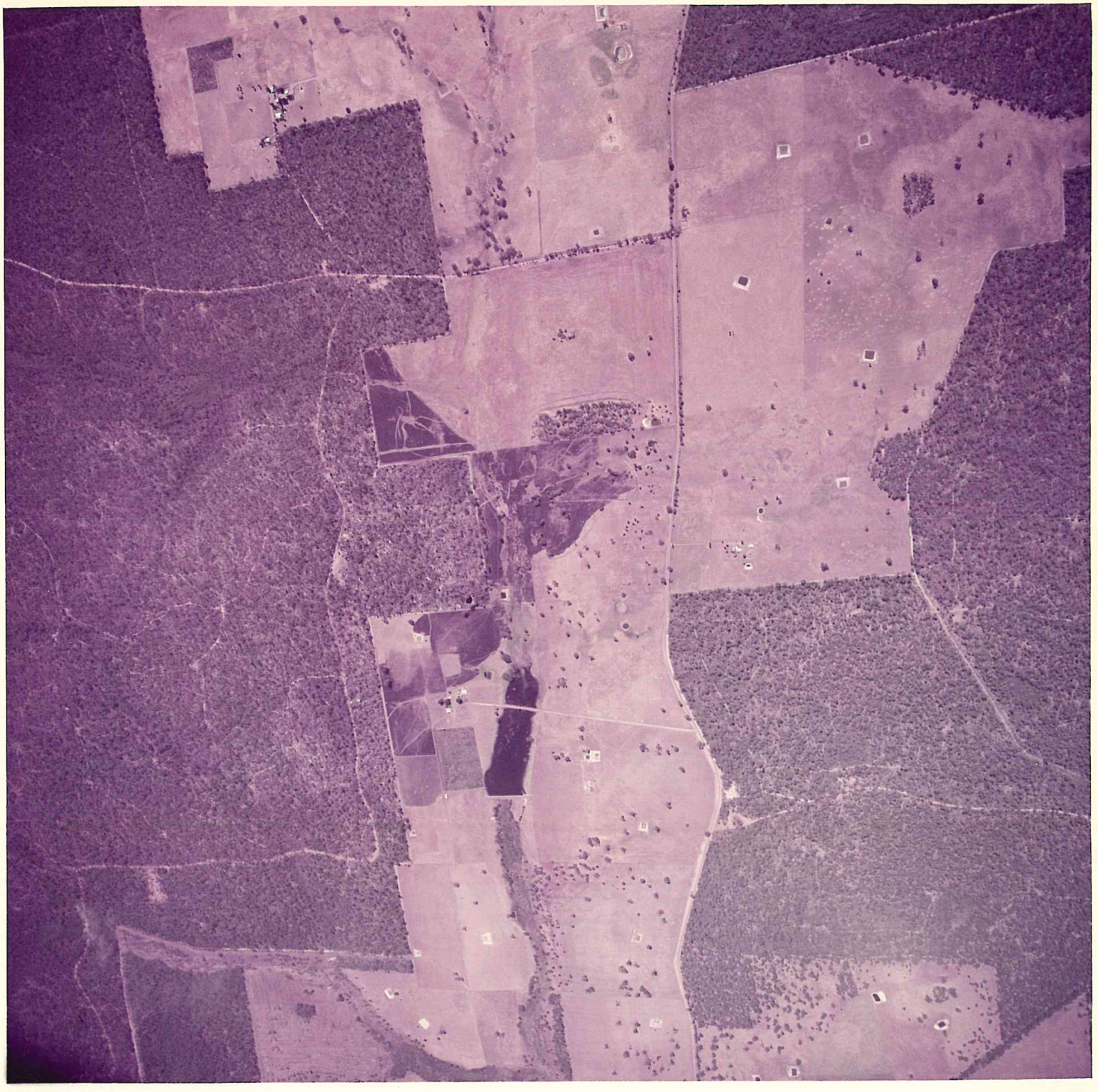
LOCATION	SUBJECT	Date of Photography	Roll S/SP 6/82	Altitude 6000'	SCALE: Nominal 1 : 11500	N
Block Coupe	SALT REHAB	11/82	Frame	Lens 40mm	Actual	

5.4 Dawson's Property

Location: East of Manjimup.

Purpose: evaluation of wildfire damage to property - M8 1982.

Specification: 40mm lens at 10 000 feet. Area covered - 1 600 ha.



Forests Dept. Aerial Photography Group Bunbury

LOCATION	SUBJECT	Date of Photography	Roll 5/80 1/82	Altitude 10,000'	SCALE: Nominal 1:18,000	
Block Coupe	FIRE DAMAGE	3·82	Frame 12	Lens 40mm	Actual	

5.5 Clover Farm

Location: Research trials, Busselton.

Purpose: clover seeding and fertilisation rate trials.

Specification: 80mm lens at 4 000 feet. Area covered 75 ha.

Forests Dept. Aerial Photography Group Bunbury

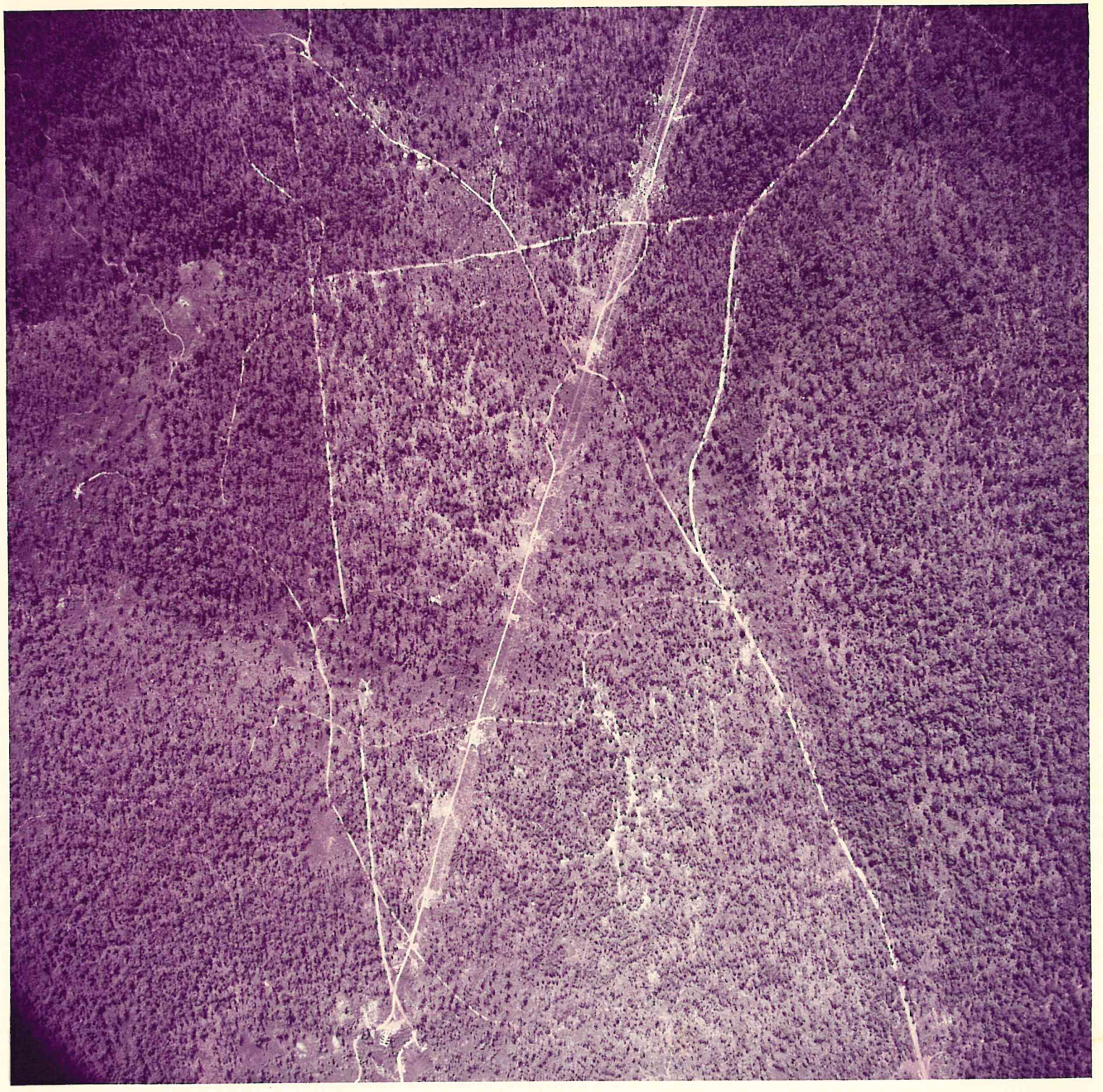
LOCATION	SUBJECT	Date of Photography	Roll	Altitude	SCALE:		
	CLOVER		4/83	4,000		Nominal 1:6,000	N
Block Coupe	TRIALS	16-11-84	Frame 8	Lens 80MM		Actual	

5.6 Victoria Catchment Logging

Location: 1983 Northern Region thinnings.

Purpose: earlier obliques taken were unsucessful. Vertical aerial photography clearly shows the extent of logging operations.

Specifications: 40mm lens at 4 000 feet. Area covered 100ha.



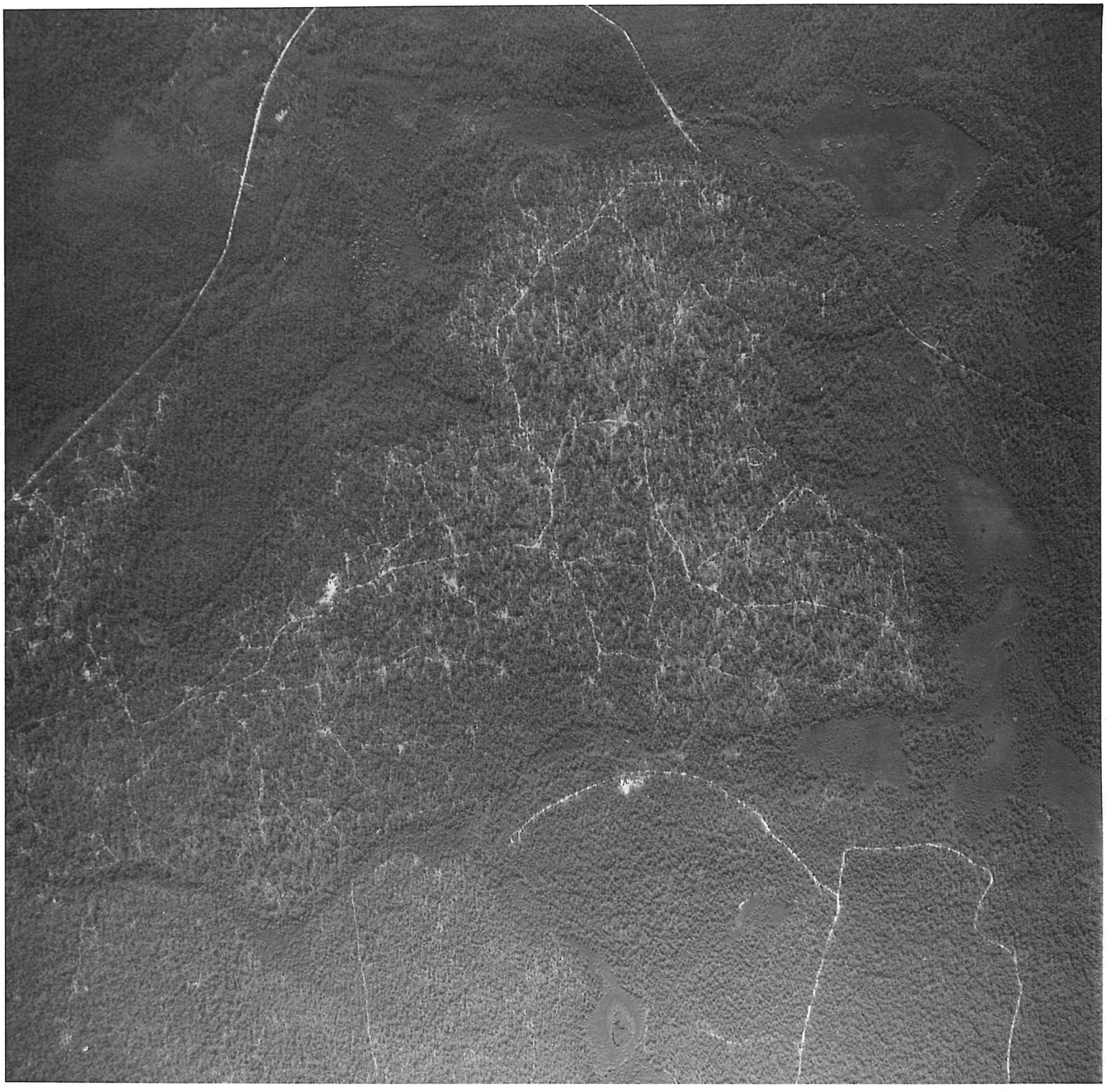
Forests Dept. Aerial Photography Group Bunbury

LOCATION	SUBJECT	Date of Photography	Roll	Altitude	SCALE: Nominal 1:7,500	N
Victoria Catchment	Jarrah		16/83	4,000'		
Block Coupe	Thinnings		Frame 3	Lens 40mm	Actual	

5.7 Hardwood Logging, Canebreak Block

Purpose: used for mapping regeneration areas.

Specification: 40mm lens at 10 000 feet. Area covered 1 600 ha.



Forests Dept. Aerial Photography Group Bunbury

LOCATION	SUBJECT	Date of Photography	Roll	Altitude	SCALE: Nominal	N
Block Coupe CANEBREAK	LOGGING	1/84	2/84	10000'	1 : 18000	
			Frame 5	Lens 40mm	Actual	

5.8 Jarrahdale Forests Department

Specification: 0mm lens at 00 feet. Area covered - 0 ha.

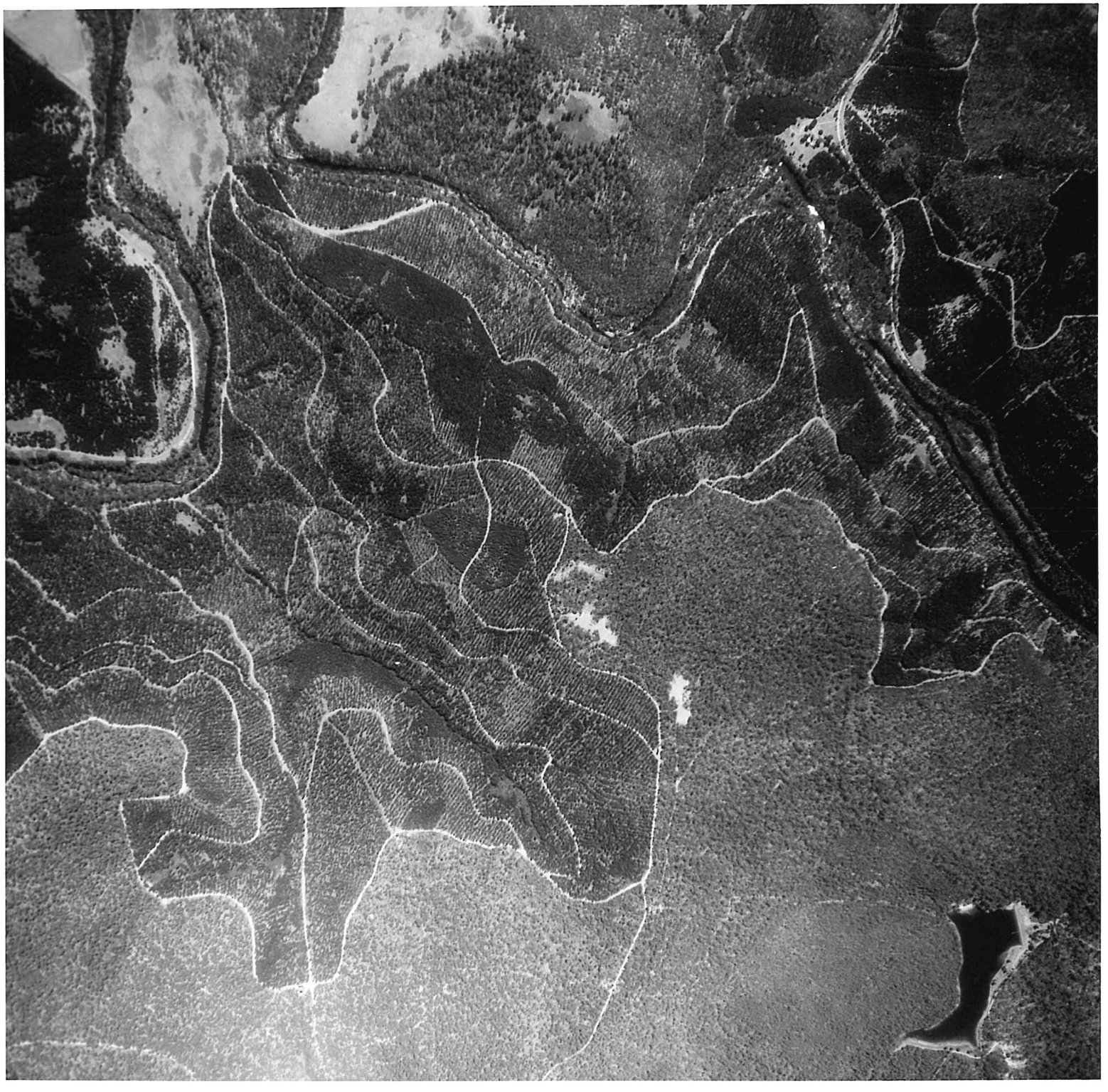
Forests Dept. Aerial Photography Group Bunbury

LOCATION	SUBJECT	Date of Photography	Roll	Altitude	SCALE: Nominal	→
JARRAHDALE F.D.			N/R 2/84	1,500'	1:1,500	
Block Coupe		1984	Frame 3	Lens 80 mm	Actual	

5.9 Lewana Plantation

Purpose: used to accurately plot unthinned areas inside 1982/83 thinning operations - eg. skyline, steep areas.

Specification: 40mm lens at 10 000 feet. Area covered 1 600 ha.



Forests Dept. Aerial Photography Group Bunbury

LOCATION	SUBJECT	Date of Photography	Roll	Altitude	SCALE:		
LEWANA	PINE		2/84	10000'		Nominal 1 : 18000	N
Block Coupe	PLANTATION	17 - 1 - 84	Frame 25	Lens 40mm		Actual	

5.10 Recreation Planning, Shannon

Purpose: show facilities and general layout for planning purposes.

Specification: 80mm lens at 6 000 feet. Covered area of 170 ha.

Forests Dept. Aerial Photography Group Bunbury

LOCATION	SUBJECT	Date of Photography	Roll	Altitude	SCALE: Nominal	
SHANNON	RECREATION SITE	12·4·83	3/83	6,000'	1:8,000	
Block Coupe			Frame 3	Lens 80 mm	Actual	

6. SUPPLEMENTARY PHOTOGRAPHY CAPABILITY

6.1 Aircraft

The aircraft used for the acquisition of Supplementary Aerial Photography are the Forests Department's Piper Cubs. Only three of these aircraft are suitable for vertical photography. These have a hole in the floor and a mount for the camera.

The location of these aircraft is dependent on the requirement for photography within each region. The use of the aircraft for aerial photography must be scheduled to fit in with other departmental requirements.

6.2 Airspace Restrictions

The area where aircraft movements are restricted is shown in Figure 1. In the Controlled Airspace Zone, 24 hours notice of flight plans may be required before any flight in the area. This will depend on the altitude and the area involved.

Photography can be taken in these areas, but all proposals should be discussed with the A.P.& I. Section in Bunbury to evaluate feasibility.

Other general restrictions on aircraft movements outside of Controlled Airspace are - maximum altitude - 10 000 feet A.S.L. (without oxygen)
- minimum altitude: 1. 1 500 feet A.G.L. (over built-up areas)
: 2. 500 feet A.G.L. (over forest)

6.3 Flight Line Navigation

Navigation for aerial photography is done visually. This restricts the ability to fly accurately along a pre-determined flight line for extended distances. If long, accurate lines or a large number of parallel flight lines are required the use of the Motorola Navigation System should be considered. This system is only available during the Dieback Photography season (Feb. - June) each year. Accurate plotting of the principal point for each photograph can also be produced.

6.4 Weather Restrictions

Supplementary photography is normally carried out under clear blue skies; as clouded and sunlit areas on the one photograph cannot be adequately compensated for due to the varying exposure values required. Suitable cloud free days are limited during the year, and smoke and haze in late spring and summer may make conditions unsuitable.

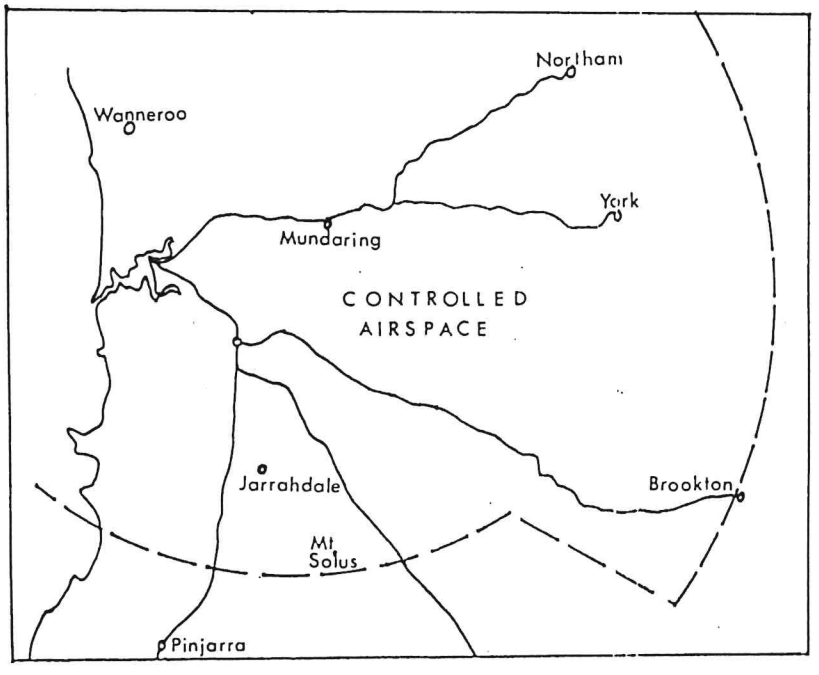


FIG. 1

7. ORDERING PHOTOGRAPHY

7.1 Check of Existing Photography

A check must be made for existing suitable photography. There are three types which may be of use:

(a) Lands and Surveys Department and other Agencies - records held at Regional I.& P. Offices and at Mapping Branch (SHQ).

(b) Supplementary
(c) 70mm Dieback } records held at A.P.& I. Office, Bunbury.

Supplementary Photography should only be requested when existing photography is unsuitable, and specifications do not match capability of Lands and Surveys photography. If you are unsure, check with the A.P.& I. Section.

7.2 Requests

There are two ways for requesting Supplementary Photography:

(a) Non Urgent Photography

Requests are called in December each year for proposed photography in the coming Financial year. This request is for both Lands and Surveys Department and Supplementary. The request for Supplementary Photography on form FD 805 (eg. over the page); should be completed and returned to the A.P.& I. Section by February 7th.

If the photography is approved by the Air Photo Committee, the A.P.& I. Section will budget for the cost of any aircraft hours required for photography.

A fund number is still required to cover costs of colour processing and printing if necessary.

(b) Urgent Photography

Requests can be made at any time during the year on FD 805 'Request for Supplementary Photography'. The person requesting the photography will require a fund number to cover the aircraft operating costs and any colour processing and printing costs incurred. All requests for Supplementary Photography must be approved by your Regional Leader Planning before being forwarded to the A.P.& I. Section.

REQUEST FOR SUPPLEMENTARY PHOTOGRAPHY

FD 805

Forests Department

(Aerial Photography and Interpretation Section, Bunbury)

Job Name: PLANTING AREAS. GORDON 2 and 4.

Purpose of Photography: To Identify Planting Areas.

Date required: 30/10 1984

Attach a 1:50 000 scale map detailing boundaries. Area: 160 (ha.)

Photography type: Vertical (Piper Cub): ✓

: Motorolla-controlled Navigation (Islander):

: Oblique :

Film Type: B & W ✓ Colour Negative

Colour Positive Colour Infrared

Photograph Size 25cm x 25cm Photo/Transparency Scale (Approx.) 1:15 000

Special Conditions or Requirements: Landing Marked (X) on attached map to be enlarged as large as possible on a 25cm x 25cm print.

Existing Photography:

(1) 230mm x 230mm (Records at Division, I & P Office and Mapping Branch):

Unsuitable

Date Flown: Scale:

(2) Supplementary (Records at A.P.& I. Section, Bunbury): No current photography

Date Flown: Scale:

Why is existing Photography inadequate for present purpose? Logging has taken place since 1982.

Requested by: A/F Smith, Manjimup Date: 1/7/84

Authorised by: SDFO J. Bloggs Date: 1/7/84
(R/L Planning)

Fund No.: 07-07-84M

7.3 Photography Type

The three options here are:

(a) Vertical Aerial Photography

Features:

(i) using the Hasselblad camera and Piper Cub aircraft.
(ii) available throughout the year.
(iii) long parallel flight lines are difficult using the piper cub aircraft. (Insufficient navigation aids.)
(iv) photograph principal points, if required, need to be plotted by hand.

(b) 70mm Motorola Controlled Vertical Photography:

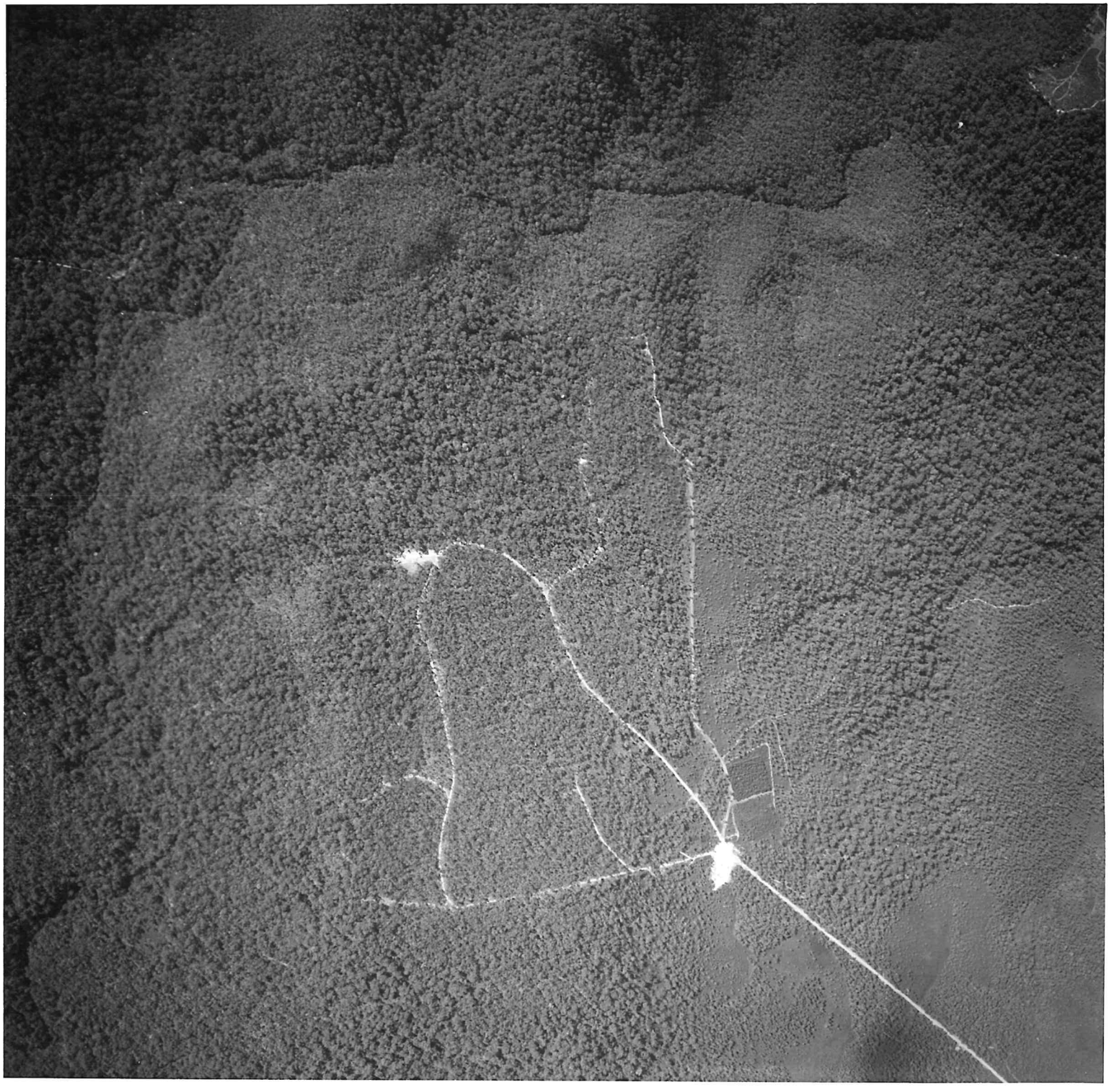
Features:

(i) currently only available for six months of the year (Feb. to June)
(ii) jobs need to be programmed to avoid conflict with Dieback Photography.
(iii) uses Islander aircraft and Motorola Navigation Equipment.
(iv) Vinten cameras or Hasselblad camera can be used.
(v) Vinten cameras must be used if automatic plotting or principal points is required.
(vi) flight lines pre-set to ensure adequate side-lap.
(vii) able to cover large area (many flight lines) with full stereo coverage.

(c) Oblique Photography:

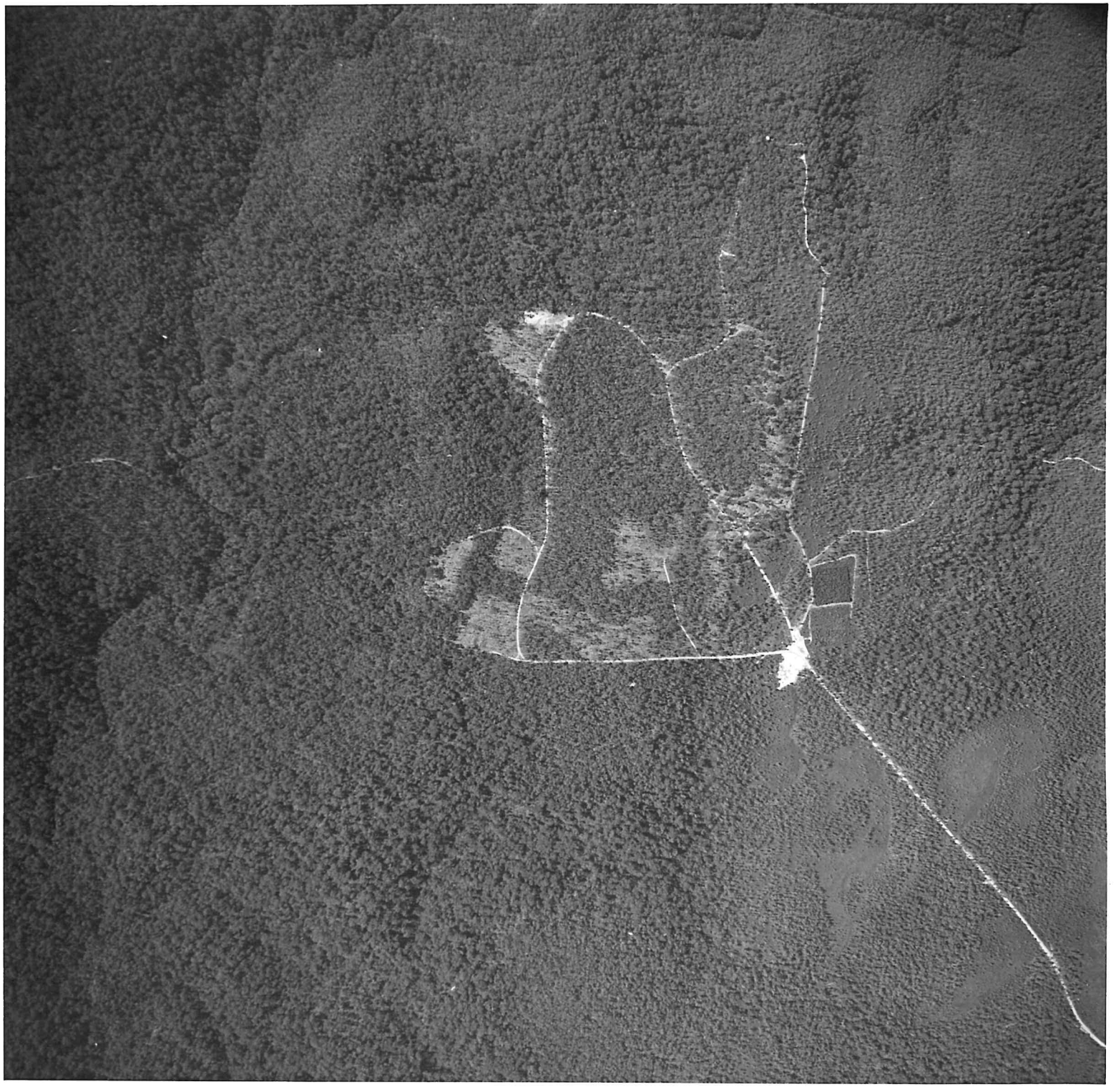
Features:

(i) this is a photograph taken with the camera axis intentionally directed between the horizontal and the vertical. They can be taken from any aircraft (with the authorised removal of window or door).



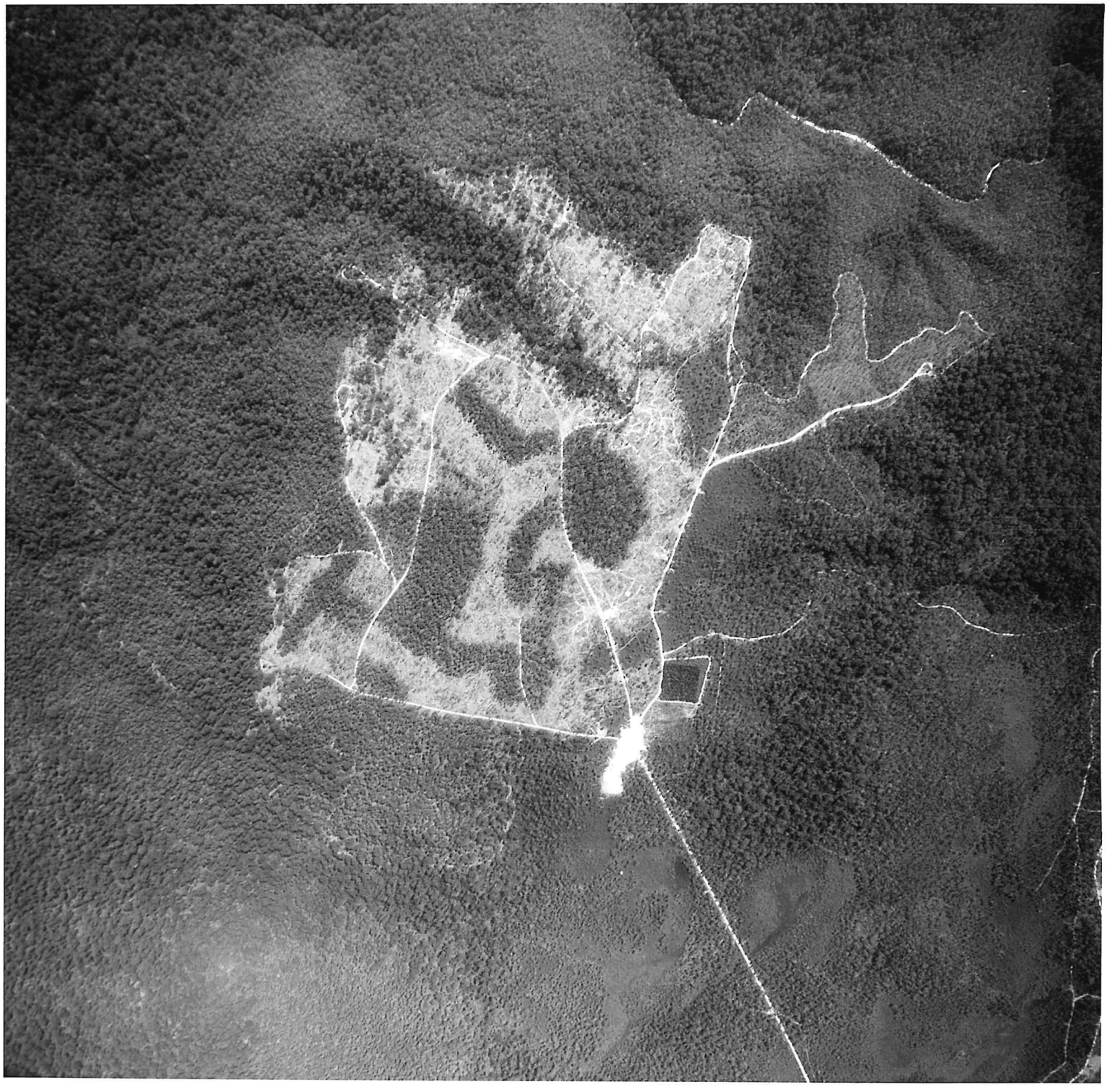
Forests Dept. Aerial Photography Group Bunbury

LOCATION	SUBJECT	Date of Photography	Roll	Altitude	SCALE		
Block: BEAUIS Coupe: 2		12/3/82	28/82	10 000'	..	Nominal 1 : 18000	1 N
			Frame 145	Lens 40 mm		Actual	



Forests Dept. Aerial Photography Group Bunbury

LOCATION	SUBJECT	Date of Photography	Roll	Altitude	SCALE		
Block: BEAVIS Coupe: 2		8/11/82	22/82	10000'	..	Nominal 1:18000	1 N
			Frame: 24	Lens: 40mm		Actual	



Forests Dept. Aerial Photography Group Bunbury

LOCATION		SUBJECT	Date of Photography	Roll	Altitude	SCALE		
Block	Coupe			11/83	10000'	..	Nominal 1: 18000	1 N
BEAVIS	2		10/10/83	Frame 26	Lens 40mm		Actual	

7.4 Film Type

There are four types available:

(a) Panchromatic (Black and White).
(b) Colour Negative - prints.
(c) Colour Infra-red (C.I.R.) - Transparencies/prints.
(d) Colour Positive - Transparencies.

The attributes of each are discussed in Section 2.

7.5 Photograph Size

The paper size usually used for all Supplementary photographs is 25cm x 25cm (10 inches x 10 inches) eg. This folio. Larger and smaller sized photographs can be produced on request.

7.6 Photograph/Transparency Scale

The desired (Nominal) scale should be stated.
A photograph can be printed to an actual scale, if required. Eg. Section 3.1. This is not possible for transparencies.

8. COSTS

All costs are approximate, and were made at July 1984.

8.1 Aircraft Hire

$60.00 per hour.

8.2 Film Processing

(a) Black and White - processed by A.P. & I. Staff.

(b) Colour (VCS 120) develop and proof:- $ 6.00

(c) C.I.R., 70 frames:- $45.00

(d) Colour Negative and Positive, 70 frames:- $45.00

8.3 Printing

(a) Black and White - no charge - prepared by A.P.& I. Staff.

(b) Colour Negative - standard 25cm x 25cm:- $ 5.50

8.4 Enlargements

(a) Black and White - no charge.

(b) Colour Negative: 41cm x 41cm $25.00

: 51cm x 51cm $29.00

9. GLOSSARY

This glossary does not cover all technical terms used in Aerial Photography. Only those relevant to this folio are listed.

Actual Scale:	See scale - actual
A.G.L.:	Height "Above Ground Level"
Aircraft:	
Islander:	Norman Britten Islander; contracted to do the flying for the 70mm dieback photography programme, and the aircraft burns for the Forests Department. It is a high-winged, twin-engined plane.
Piper Cub:	Used for all fire spotting and for most of the Supplementary photography required by the Forests Department. A high-winged, single engined, light aircraft.
A.S.L.:	Height "Above Sea Level"
Camera:	
Hasselblad:	It is a motorised 2¼ x 2¼ single lens reflex camera using lenses with leaf shutters.
Vinten:	Is a motorised 70mm single fixed lens camera using a high speed focal plane shutter.
C.I.R.:	See colour Infra red.
Colour Corrected Lenses:	(Apochromatic) Since different colours have different points of sharp focus, the lens elements correct focus distance and allow reproduction of fine detail over the three primary colours.
Colour Infra Red (C.I.R.)Film:	The emulsion on the film is sensitised to record mostly in the near infra red portion of the spectrum. The green colours are recorded as reds, and the film is often termed "false-colour film". It is used in the detection of dieback diseased plants and trees, and in saltwater, wetland, pollution and environmental studies.

Colour Negative Film:	A colour film in which the subject tones, to which the emulsion is sensitive, are reversed or complimentary. Colour prints are produced from colour negative film.
Colour Positive Film:	See Colour Positive Transparencies.
Colour Positive Transparencies:	Colour Film that may be viewed with transmitted rather than reflected light and normally show finer detail and sharper definition than do paper prints.
Contact Scale:	See Scale - contact.
Emulsion:	A suspension of a light-sensitive silver salt in a colloided medium which is used for coating photographic films, photos and papers.
Enlargement:	The production of a photograph at a scale larger than the original.
Filter:	A transparent material which by absorbtion, selectively modifies the light transmitted through an optical system.
Hasselblad Camera:	See Camera - Hasselblad
Internegatives:	A negative produced from a positive transparency which enables the printing of a colour photograph.
Islander:	See Aircraft - Islander
Lands & Surveys Dept. Photog.:	(Survey Photography) Large format photography (230mm x 230mm) acquired by the Lands and surveys Department or associated agents using a metric camera.
Linear Distance:	Distance across the negative.
Metric Photography:	The recording of events by means of photographs, either singly or sequentially, together with appropriate co-ordinates, to form the basis for accurate measurements.
Motorola Navigation System:	A two station micro-wave navigation system. It incorporates ranging equipment which triggers the two ground stations and interrogates each in rapid succession. The exact location of the aircraft is then determined by triangulation using a micro-processor.

Scale:

Actual: The precise ratio of a distance on a photograph to its corresponding distance on the ground. It will vary slightly over the photograph due to relief and radial displacement.

Contact: A photographic print produced at the same scale/ format as the negative or positive it was taken from.

Nominal: Measured as a ratio between f/h where 'f' is the focal length of the camera and 'h' is the height of the camera above mean ground elevation. Scale is always expressed as a ratio, ie. 1:25 000.

Stereo: The orientation of photographs when properly positioned for stereoscopic viewing. Photographs so oriented are said to be 'in stereo'.

Stereoscope: A binocular optical instrument for assisting the observer to view two properly orientated photographs to obtain the impression of a three dimensional model.

Stereoscopic Vision: The particular application of binocular vision which enables the observer to obtain impression of depth, usually by means of two different perspectives of an object.

Supplementary Aerial Photography (S.A.P.): All forest management photography except for dieback photography acquired with Vinten cameras and Motorola Navigation System.

Transparency: A photographic print on a clear base, especially adaptable for viewing by transmitted light.

Vertical Photography: See photography - Vertical

Vinten Camera: See camera - Vinten

BACK COVER

Oblique Photograph

Karri regeneration hand burn, Dombakup Block.

Note: echelon burning technique

Mount: The camera holding system, which ensures the cameras are positioned vertically in the aircraft.

Nadir: The point where a perpendicular from the ground through the lens centre, strikes the film.

Negative: A photographic image on film, in which the subject tones are reversed or complimentary.

Nominal Scale: See scale - Nominal

Non Metric Photography: Using a camera whose interior orientation is completely or partially unknown and frequently unstable.

Oblique Photography: See photography - Oblique

Panchromatic: Film that is sensitive to light of all colours. ie. Black and White Photography.

Photo Coverage: The ground area represented on aerial photographs.

Photography:

Oblique: A photograph taken with the camera axis intentionally directed between the vertical and the horizontal.

Vertical: An aerial photograph made with the camera axis vertical in an aircraft.

Principal Point: The optical centre of the photograph. The point on the photograph from which a perpendicular line passes through the centre of the camera.

Print: An image on paper made from the negative or positive transparency.

Piper Cub: See Aircraft - Piper Cub.

Positive Film: A Photographic film on which the images when developed are the same as the subject tones.

Radial Displacement: Linear displacement of image points to or from the centre of the image field, caused by the fact that objects at different angular distances from the lens axis undergo different magnifications.