



PROGRAM A

Fuels Classification and Availability

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Acknowledgements

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→ **Outline**

1. Pilot appraisal of Visual fuel assessment by NSW RFS operational staff - Wyong area
2. Application/appraisal of Visual assessment (as part of large NDMP project appraising the application of remote sensing) -Jilliby SF
3. Application/appraisal of Visual methodology in heath fuels - Ngarkat
4. Fuel strata classification considerations

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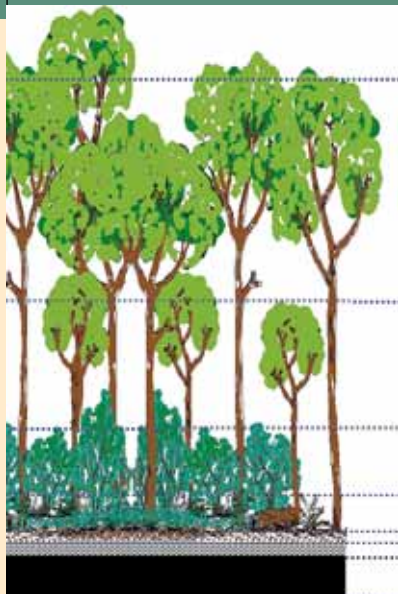


1. Pilot appraisal - Wyong NSW RFS, April, 28 NSW RFS volunteers and staff



1. Classroom: Vesta/OFHG, 'fat' Levy rod, Destructive sampling
2. Forest: 7 teams of 4, 2 fuels, 50m transect, Visual every 10m, Destructive at 20m, 40m, 2 * 10m of 'fat' Levy Rod
3. Present results, consistency, discuss successes and issues

1. Pilot Appraisal -Wyong, - strata classification



Canopy Over-storey PCS, FHS, mean Height

Intermediate Can PCS, FHS, mean Height

Elevated Fuel, PCS, FHS, mean Height

Near-Surface Fuel, PCS, FHS, mean Height

Surface Fuel PCS, FHS, mean Depth

Ground Fuels: Duff

1. Pilot Appraisal -Wyong, - Visual methodology (Vesta)

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Fuel 1



Fuel 2



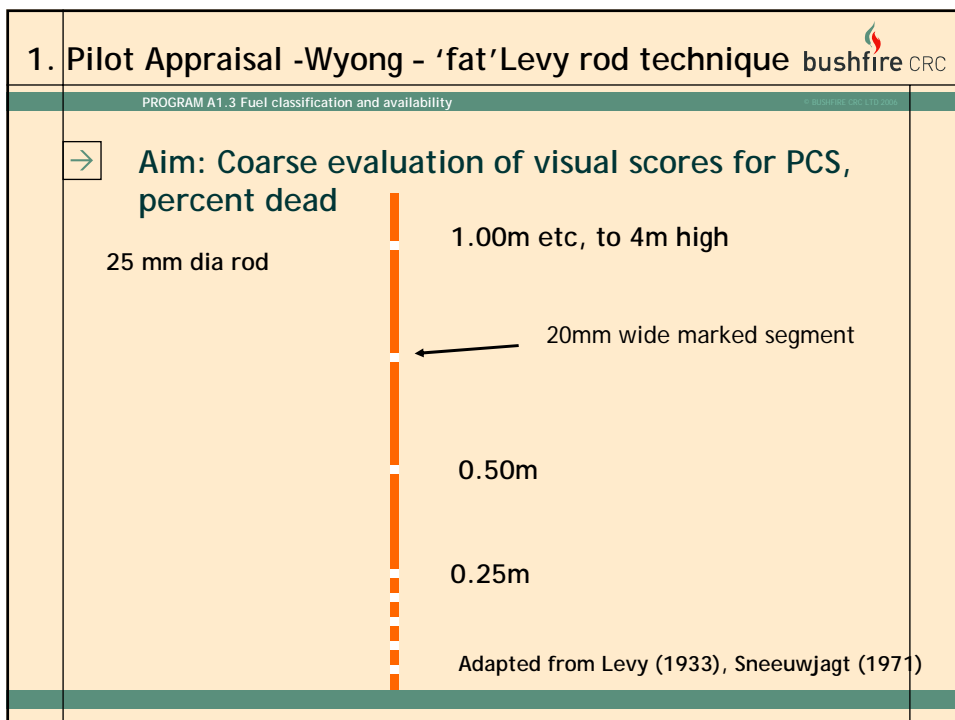
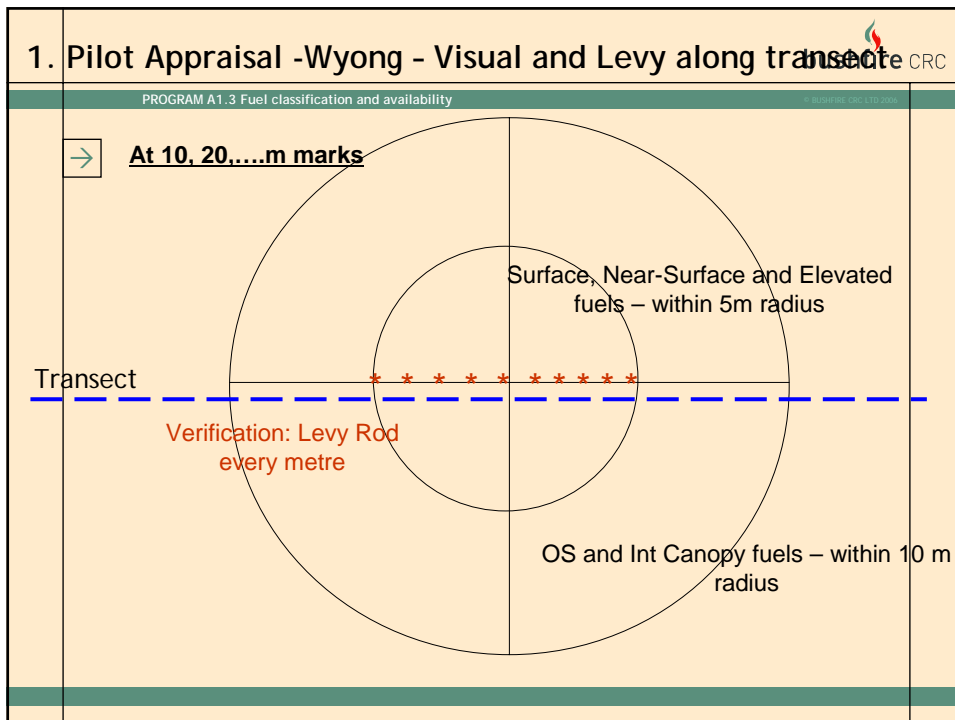
• Pilot Appraisal -Wyong, - Visual methodology (Vesta)

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1. Applied along transects, Ht/Dpth, PCS and FHS recorded at each 10m point, mean for given stratum for each transect
2. Scores for different strata not combined (unlike OFHG)
3. Variables so far included in VESTA ROS equations for dry sclerophyll are; Surface FHS, Near-Surface Ht and FHS, (Elevated Ht and FHS?)
4. Ht and PCS for Intermediate and Overstorey Canopy not yet utilised, but significant for fire-behaviour



1. Pilot Appraisal -Wyong - 'fat'Levy rod technique bushfire CRC

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Scoring

1.25m



Score: 'L' (one or more live ff touch)

1.00m



Score: 'B' (both L and D ff touch)

0.75m

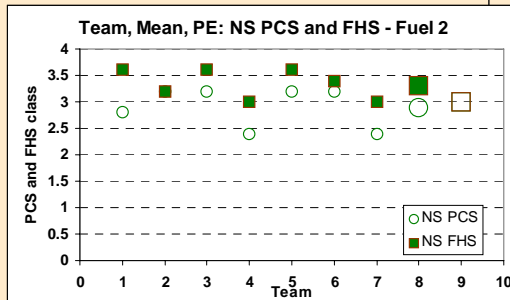
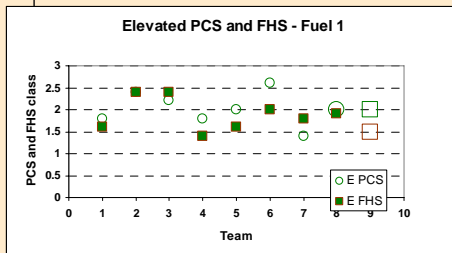



Score: 'A' (no L or D ff touch)

1. Pilot Appraisal- Wyong: Team means for PCS and FHS, 50m transects bushfire CRC

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1. Pilot Appraisal- Wyong: Confirmation Visual PCS and %Dead from Levy 

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→ Team	10m NS	PCS	PCS	L rod	% Dd(FHS)	%Dd(FHS)	L rod
1	25	50	60	20	50	53	
2	50	75	80	0	20	81	
3	50	75	90	50	100	88	

Team	30m NS	PCS	PCS	L rod	% Dd(FHS)	%Dd(FHS)	L rod
1	50	75	80	50	100	54	
2	50	75	80	50	100	54	
3	75	100	80	50	100	77	


- Estimation of PCS from Levy rod measurement: fraction of rod segments at which fine fuel touched rod
- Estimation of %Dead from Levy rod measurement: fraction of segments D or B, of total segments with fine fuel 'touches'




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2→ Application - 'Jilliby SF Project', \$3/4 m: NSW RFS (Natural Disaster Mitigation Program): 'Bushfire HR Assessment' and 'Assessing Fuels by Remote Sensing':

1. NSW NPWS
2. Forests NSW
3. UNSW
4. SCA
5. Hunter group of 11 Councils
6. GHD
7. (Bushfire CRC)

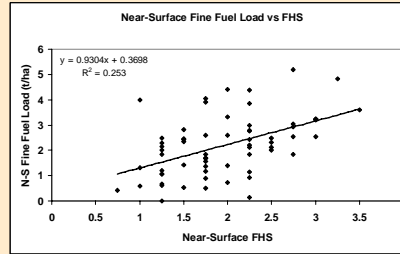
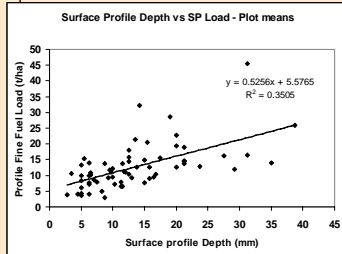
	2. Application- Jilliby SF, as part of appraisal remote sensing	
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	<p>→ Jilliby data - 130 plots 20m radius, random stratified</p> <ol style="list-style-type: none"> 1. Fuel assessment <ol style="list-style-type: none"> a) Four Visual assessments each plot b) Eight Destructive per plot (initially 4), for ~ 70/130 plots 2. Veg structure, species assessment (Peter Moore, Duncan Sutherland) 3. Intensive Remote sensing - Landsat to Lidar (Peter Moore, Duncan Sutherland) 4. Other variables: slope, aspect, time since fire, soil, radiometric 5. Progress: <ol style="list-style-type: none"> a) Fuels data summary, preliminary analysis b) Analysis remote sensed data commenced 	

	2. Application- Jilliby SF, as part of appraisal remote sensing	
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	<p>→ Preliminary Jilliby Fuel Results</p> <ol style="list-style-type: none"> 1. Variation, even in small plots (40 m dia) 2. Mean Percentage error for Visual PCS and FHS within plots: 35 - 70% (for example, if sample mean score is 2, and p.e. 35%, plot mean lies between 1.3 and 2.7) 3. Mean within-plot Percentage error for fuel Load (destructive samples) 50 - 70% 4. Consistent Relationship between Visual scores and Loads 	

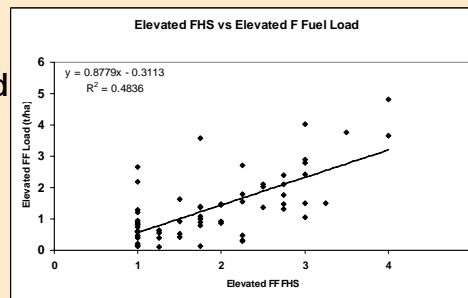
2. Application- Jilliby SF, as part of appraisal remote sensing

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Relationship FF Loads and Visual assessment



2. Application- Jilliby SF, as part of appraisal remote sensing

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1. Potential of fuels methodology, used operationally
2. Level of interest and ability of RFS crews, hence potential
3. Importance of RFS crew input and involvement in development/application of Fuels methodologies
4. Dataset of use in appraisal of remote sensing
5. Great co-operative research effort

1. Application/Appraisal- Visual methodology in heath/mallee, Ngarkat bushfire CRC

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→ **Ngarkat 2005 - preliminary**

1. Vesta visual methodology
2. Levy Rod measurements 'verified' Visual scores
3. Significant differences in Visual scores in 1991 mallee and heath reflected in fire spread


1. Application/Appraisal- Visual methodology in heath/mallee, Ngarkat bushfire CRC


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→ **Ngarkat CP - 2005**

RH: 60% T: 21 Wind: 3.5/13
 Ngarkat 2005

		Mallee	Heath
	S-FMC	14.5	19.8
	N-S FMC	11.2	13.1
	E-FMC	12.3	22.2
Duff	<u>depth (mm)</u>	0	0.0
Surface	depth (mm)	14.5	7.2
	FHS	1.1	1.8
	<u>PCS</u>	1.5	1.9
Near Surfa	height (cm)	31	21.9
	FHS	1.3	2.7
	<u>PCS</u>	1.9	3.0
Elevated	height (m)	1.62	0.7
	FHS	1.8	2.6
	<u>PCS</u>	1.8	2.2
Bark	<u>FHS</u>	1.2	0.0
	ROS km/h	0	1 to 2

1. Application/Appraisal- Visual methodology in heath/mallee, Ngarkat		
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→	<h2>Ngarkat 2006</h2> <ol style="list-style-type: none"> 1. Analysis just commenced 2. Percentage error visual scores for 12 obs 10-30%, or less 3. Visual scores of 1986 Heath and Mallee fuels differed, although magnitude small. Fire behaviour radically different. 4. Problem with subjectivity in discriminating/defining Near-Surface vs Elevated, and Elevated vs Canopy 	

		
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→	<h2>Future</h2> <ol style="list-style-type: none"> 1. Extend work with agencies in developing operational visual and destructive methodologies 2. Investigate if present Visual methodology is assessing the characteristics most critical to fire spread in heath/mallee 3. Address concerns of field crews/users: <ul style="list-style-type: none"> • subjectivity of stratum definition of Visual methods • Weight class descriptors (eg is %dead more important than FF density?) • Visual scores of average Height, PCS and FHS may not allow fuel to be 'reconstructed', and vegetation strata re-named wrt to fire behaviour (should part of the 'Elevated' stratum be included in 'Near-Surface' for example) 	



Thank you



NS? Little Forest Plateau
heath fuel
courtesy Brendan Pippen