Forest operation around bushfire management - Australia
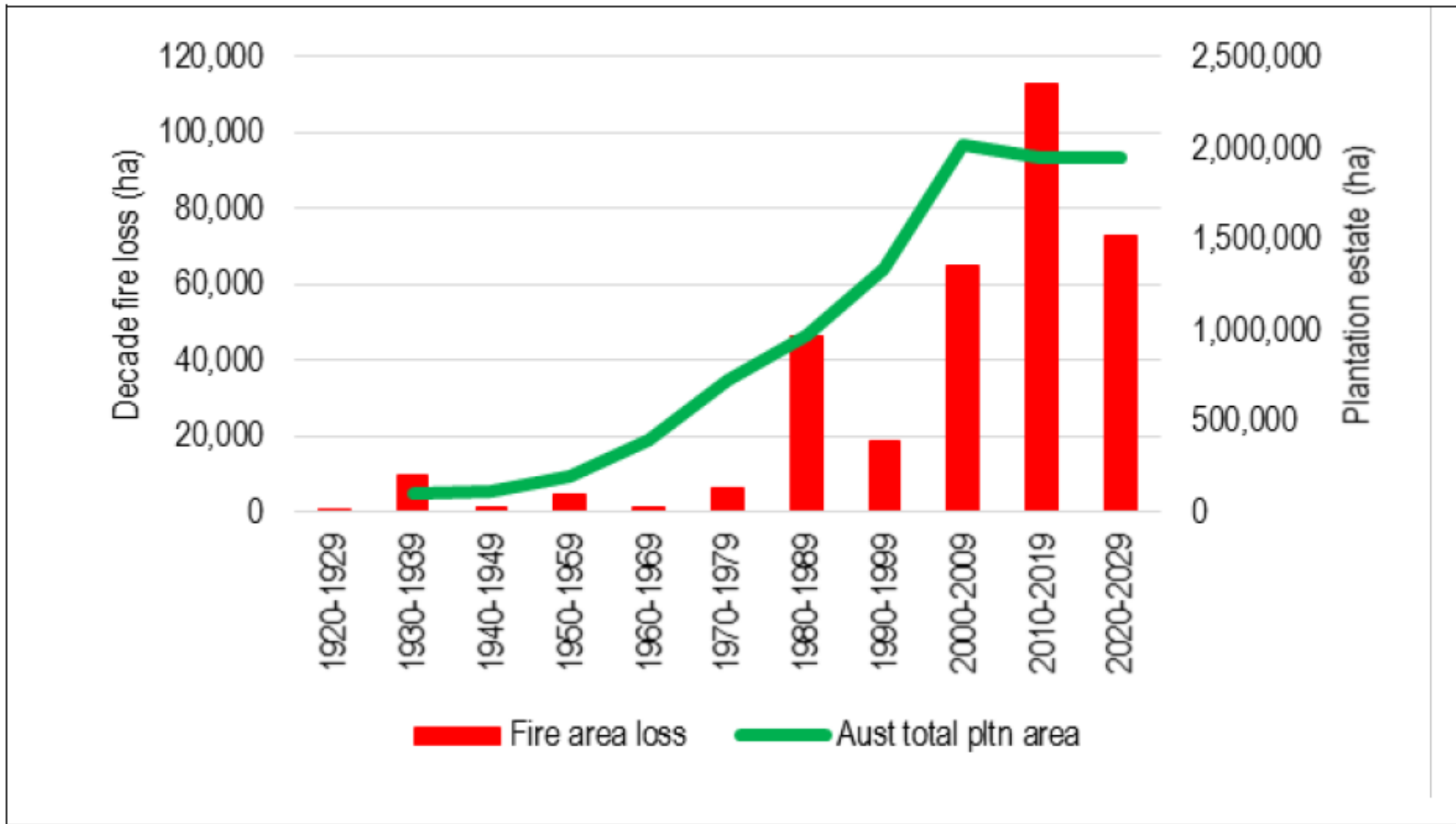
Year	Area Burned (ha)	Lives lost	homes lost
2010	37,893	0	2
2011	219,033	0	0
2012	1,400,000	0	62
2013	574,557	2	227
2014	183,677	1	5
2015	87,810	1	1
2016	268,367	1	65
2017	259,720	0	74
2018	288,422	0	37
2019	5,520,000	26	2,476
2020	37,832	0	1
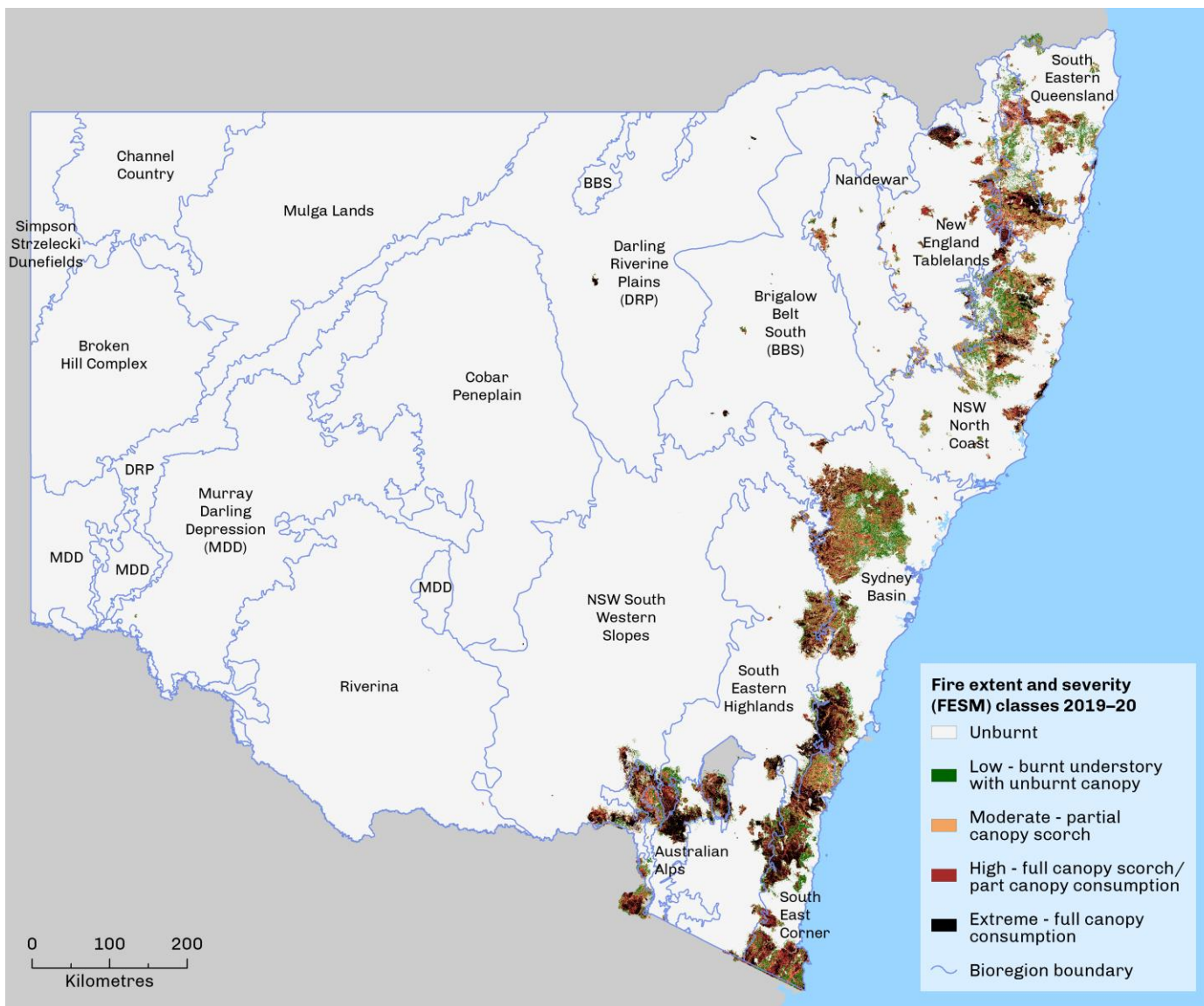
"The 2019–20 bushfire season was the worst ever recorded in NSW. A combination of one of the worst droughts on record, unprecedented weather conditions and intense fire behaviour resulted in over 5 million hectares being burnt across the state. Twenty-six lives were lost and 2,476 homes destroyed."

Salvage - *as fast you can*

Objective:
To **Conserve** the maximum amount of **Green Wood** for the future of the industry at minimum cost, and within cashflow constraints

| Strategy	Planning		Implementation			Next milestone
	Started	Complete	Started	Active	Complete	
Salvage harvest using local capacity	✓	✓	✓	✓	✗	Final FC crew to move by end of this week
Additional capacity / ramp-up mills	✓	✗	✗	✗	✗	AKD / Hyne to consider log mix data and respond
Access other growers markets and capacity	✓	✗	✗	✗	✗	ACT and NFAM to confirm acceptance
Supply customers from out of region	✓	✗	✗	✗	✗	Offer to HPP to be submitted following AKD / Hyne response
Revisit export strategy	✓	✗	✗	✗	✗	Options for Tumut small log to be confirmed
Log Storage	✓	✗	✗	✗	✗	Additional details for shortlist presented by 7/2
Salvage supply plan	✓	✗	✗	✗	✗	12 month plan to be developed with Visy green options
Long term supply plan	✓	✗	✗	✗	✗	First output by 7/2

Operational Scheduling Process

- Initial focus for harvesting on areas harvest planned and roaded prior to fire

- Modelling - operational requirements and constraints over salvage harvest timeframe

- Operational Schedule
  - Ensuring all areas are in logical units for harvest and areas operationally realistic
  - Allocating modeled harvest areas with harvest crews
  - Creating works schedule for roadworks

Inputs into modelling process

- Location down to a patch level (Isolation of retain areas)

- Yield information

- Age

- Seasonality

- Severity mapping of fire

- Silviculture treatment of stands

Aim of model

- Maximising harvest of volume suitable for domestic sawmill customers

- Harvest of highest value stands first

- Limiting volume that can be harvested by steep contractors to match operational availability

- Seasonal Access – *Challenging in June-Aug for older stands*

- Burn severity – retaining green stands

- Age constraints – ideally greater than 24 years for sawmill customers
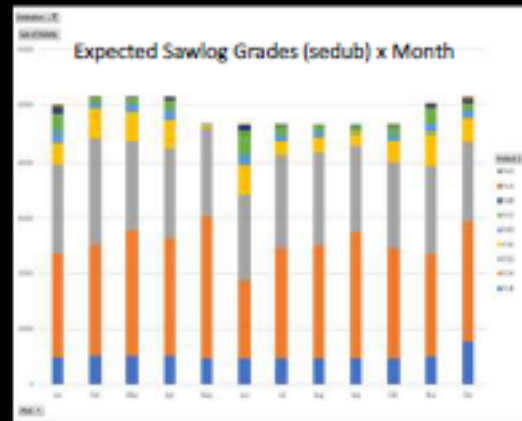
Cooperation with customers key to success

- Original estimate by pulp mills was they would max out at 40% fire affected wood – actually managed to get to 80%

- Able to facilitate and extend storage by using customer yards and facilities

- Did not over complicate decision to harvest process – no green top harvested first with any green tops retained as long as possible

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Forestry Corporation

2019-20 Fire recovery efforts

- Salvaged close to five million tonnes of softwood timber, the largest post-fire salvage in company history
- Expanded production nurseries to grow an extra three million seedlings per year
- Replanting over 14 million seedlings in first planting season post fire
- Repaired more than 5000 kilometres of roads and 80 bridges.

Age	0 to 11	12 to 18 (Not Steep)	19 to 23 (Not Steep)	24 and older (Not Steep)	12 to 18 (Steep)	19 to 23 (Steep)	24 and older (Steep)	Total
Total fire affected	27,614	6,343	4,211	8,047	442	223	468	47,348
Still Holding Green Crowns	1,102	496	650	1,025	-	-	-	
Standing Burnt Trees	26	624	270	483	442	223	238	
Harvested	150	5,223	3,291	6,539	-	-	230	15,432
% of Harvest Complete	1%	90%	94%	94%	0%	0%	49%	
Replanted								13,699
								29%

Australian Guidelines – Fire Salvage Harvesting

Salvage success influenced by:

- species

- age of the plantation

- intensity of the fire

- magnitude of the area burnt

- time lapse between fire and salvage

- proximity of processing and export facilities

- establishment of suitable log storage facilities

- management of charcoal and charcoal dust contamination

- management of market perceptions

- net grower value of salvaged log products

- regulatory requirements.

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Strong & successful emphasis on recovery to forest product markets

- Harvest dead trees within 24 months followed closely by severe damaged trees

- Successful storage of sawlogs under water for up to 10 years

- Softwood will have needed to be at least mid-rotation (age 12+) for recovery

- Hardwood close to full rotation (age 7+)

- Close coordination across supply chain required
  - Batch processing to manage differences in fire damaged timber
  - Cooperation to push process and system limits
  - Manage expectations of issues like blue stain

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Mechanical Fuel Reduction Harvesting

- 2017-18 field trials
  - Harvest prescription influenced by timber recovery
  - Poor effectiveness in reducing fine fuel load on forest floor
  - Did not reduce fire ignition risk
- Significant volumes could be recovered
  - $20 to $150 per tonne (increasing quickly in diameters under 15 cm)

Current Opinion in Environmental Science & Health
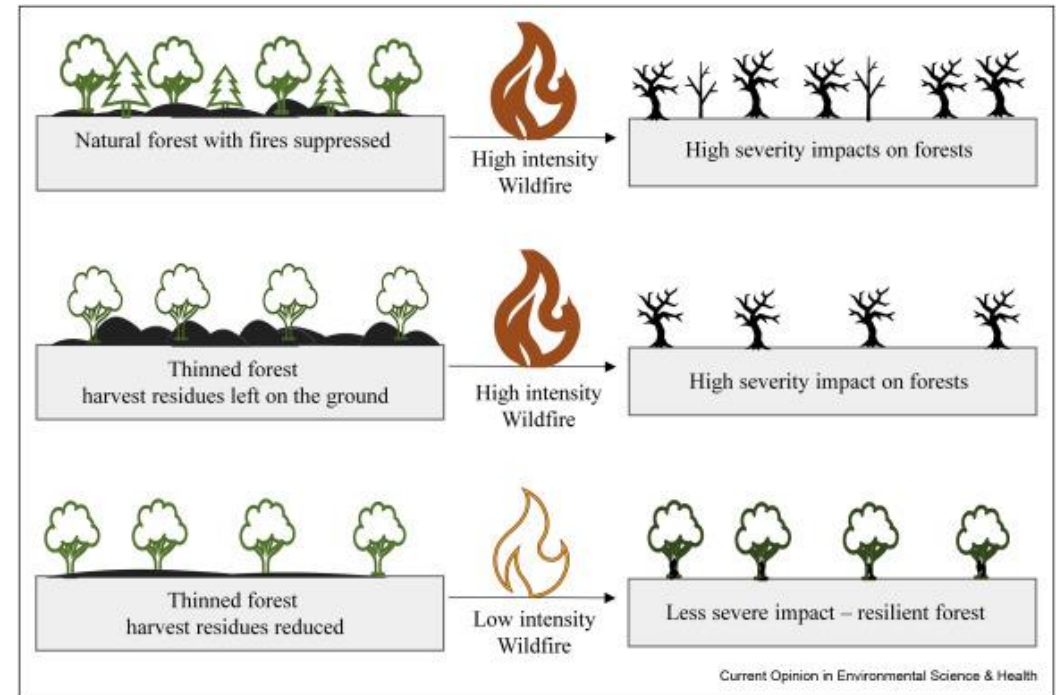
Conclusion

Mechanical fuel reduction shows promise where fine fuel load can be managed – operation needs to be driven by fire risk outcome not biomass recovery which will reduce volume and may increase or decrease costs.

Areas of fire salvage likely to be significant in future but priority on recovery to timber the product supply agreements will limit biomass availability and it will be weighted to material and sites with higher cost for harvest and recovery

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