

# Fire intensity: Does it affect coastal heathland restoration?

Eastern Suburbs Banksia Scrub at North Head, Manly  
Judy Lambert & Geoff Lambert  
(North Head Sanctuary Foundation) &  
Kate Hammill (Fire ecologist)



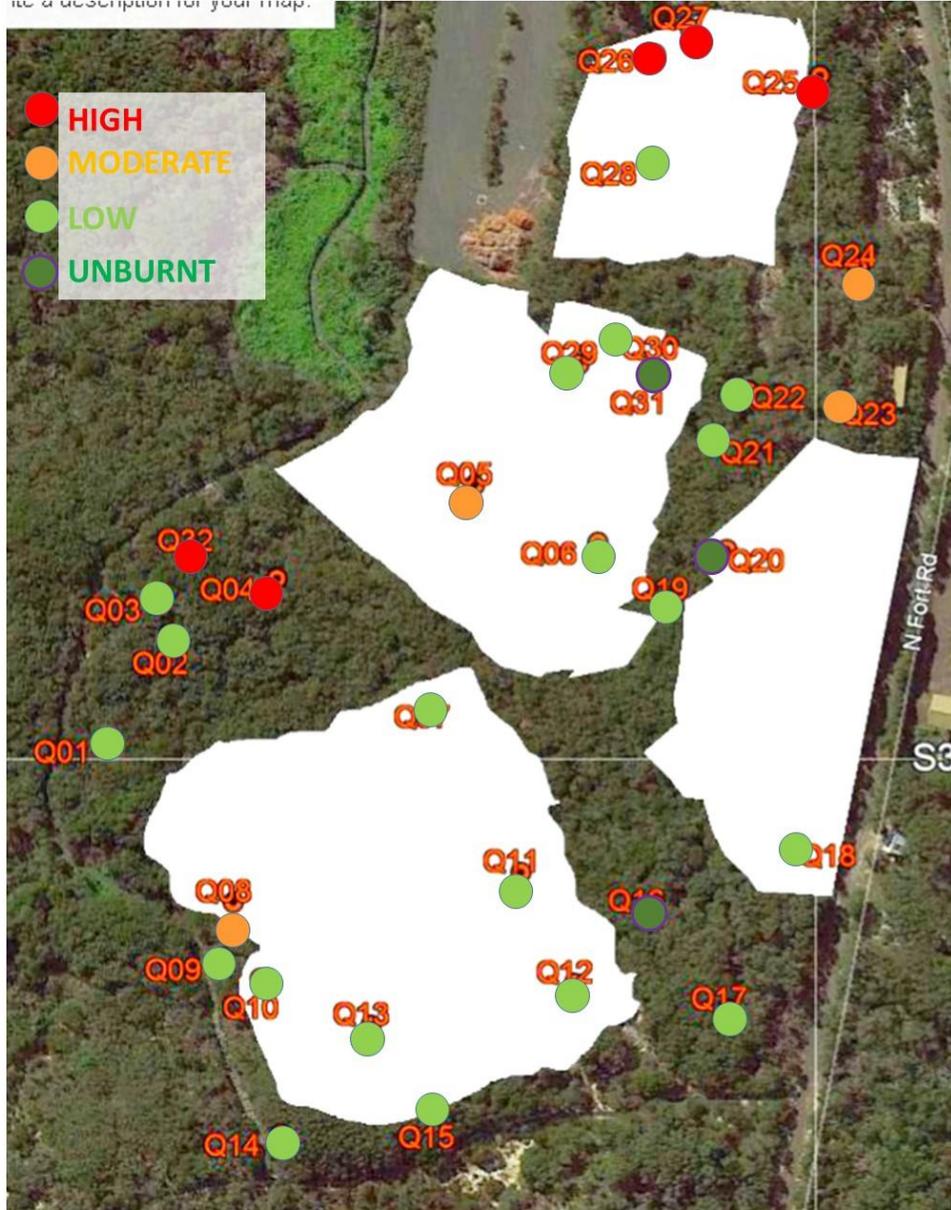
# North Head, Manly

- Largest remnants of Critically Endangered Eastern Suburbs Banksia Scrub (ESBS)
- One focus of North Head Sanctuary Foundation volunteer work since 2002
- Using planned Hazard Reduction (HR) burns to restore post-fire ESBS regeneration and control of dominance by senescing Coast Tea-tree (*Leptospermum laevigatum*)
- Previously reported study of botanical responses to HR burns in 2012 shows increased species richness during 1-3 years post-fire – but fire intensity not assessed



# Project design

ite a description for your map.



May 2018 HR burn:

50% of 4.6ha burn site fenced to exclude rabbits, remainder unfenced

32 5x5m quadrats, each with four 1x1m nested plots

Quadrats set up across vigorous and senescent ESBS – site very variable

Expert botanical assessments in each plot  
- % cover, plant counts, average heights,

species counts, reproductive states

Post-fire assessment of fire intensity – char

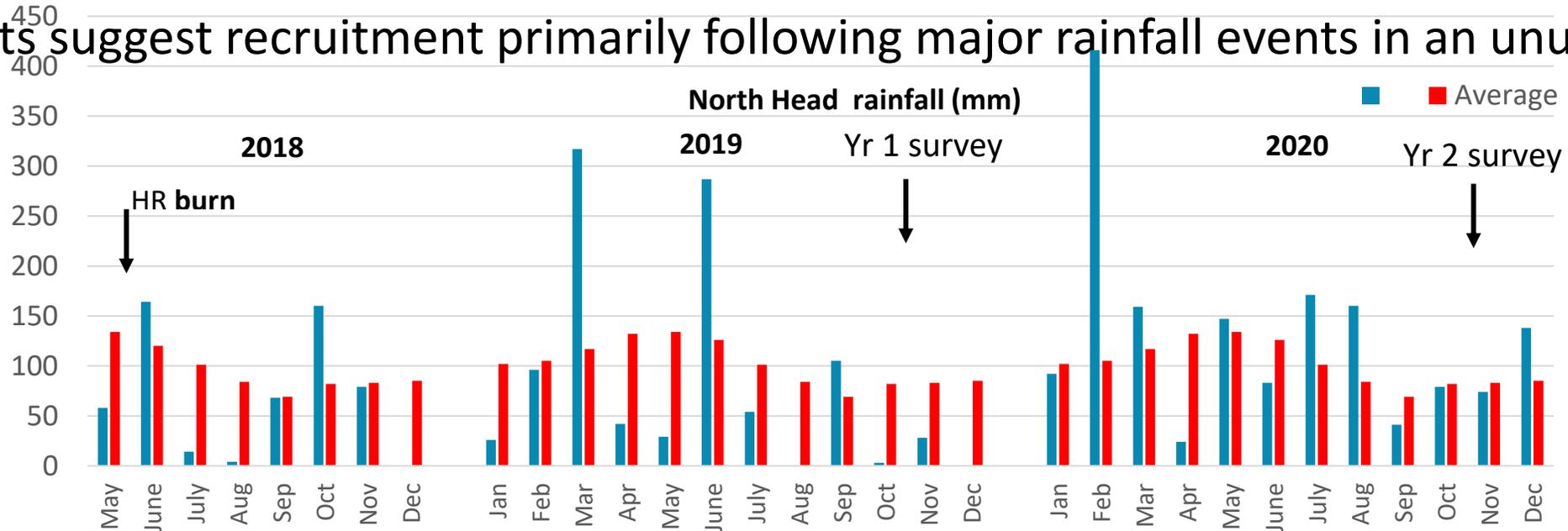
height, leaf scorch & twig diameter at 1m

above ground → High-Moderate-Low-Unburnt  
(colour coded)

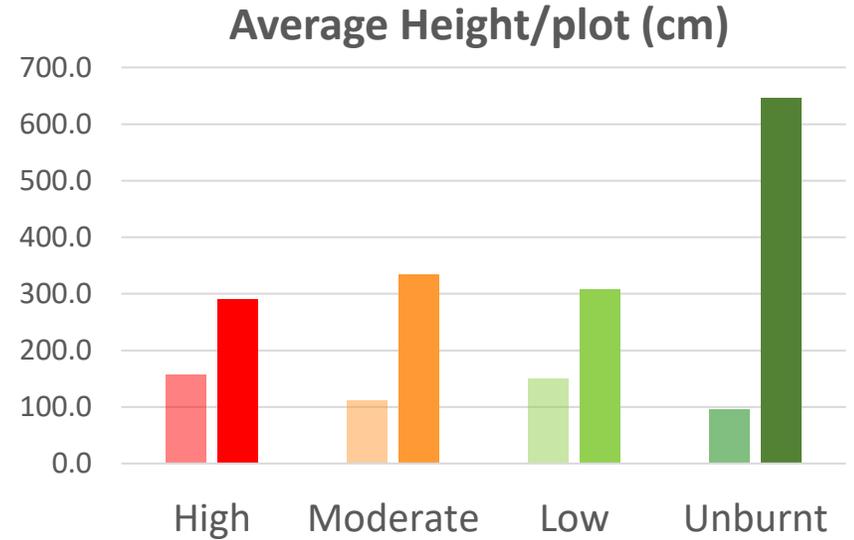
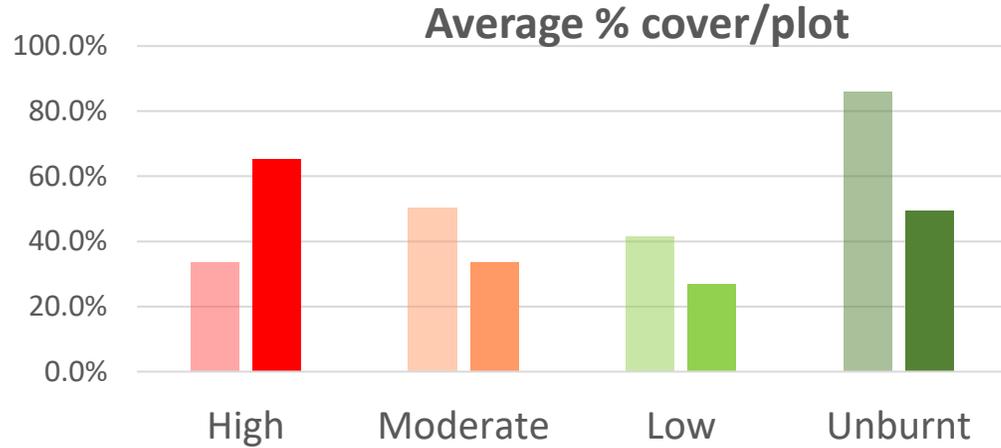
# Year 1 and Year 2 Post-fire Results in brief

	<u>Oct 2019 survey</u>	<u>Oct 2020 survey</u>
Total species (all quadrats)	141	157
Total weed species (all quadrats)	10	13
Species per quadrat	7 - 33	1 - 40

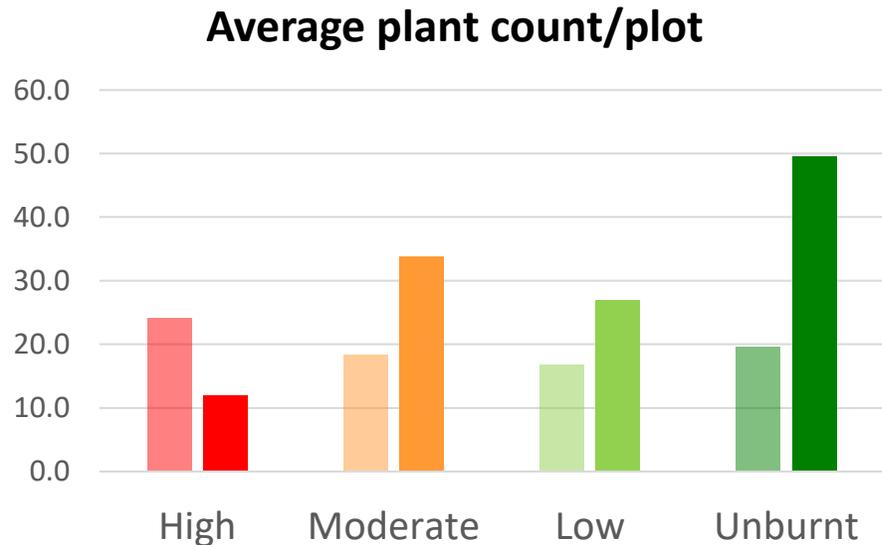
- Two distinct post-fire cohorts: established juvenile plants & very young seedlings
- No clear correlation between fire intensity & post-fire recovery response
- Results suggest recruitment primarily following major rainfall events in an unusually dry year



# Results 2.5 years post-fire, by fire intensity



Dark=Fenced;  
Lighter=Unfenced



**COOL**



**HOT**



One-year pre-fire

Early post-fire

Two years post fire



# Preliminary conclusions

**Data analysis is preliminary** - More sophisticated data analysis is planned to compare effects of treatments (multivariate ANOVA and Ordination)

- Results suggest that fire intensity is not a primary factor in post-fire restoration of ESBS
- Post-fire recruitment is strongly influenced by available moisture in early stages (seedling recruitment/age corresponded with rainfall events)
- As previously reported, rabbit exclusion has a significant positive impact on post-fire recovery



# Challenges and recommendations

- Achieving high intensity burns is limited by operational and safety requirements in a near-urban environment – but may be important for heath conservation outcomes - tea-tree dominance ('senescent ESBS') largely an edge effect - more difficult to burn at the higher intensities which may benefit species richness
- Need better experimental design to reduce other types of variation (e.g. paired sample areas that are more 'similar' pre-fire) so that effects of fire / intensity can be more readily detected
- Combining fire and pest control is important for ongoing conservation of EBSB
- Climate change (apparent tendency towards less frequent but more intense heavy rain events) may affect ESBS species post-fire recovery, and possibly the composition of this community over the long term
- We hope our monitoring data can be used again, as a 2014 & 2020 sample into the future.



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- Fire agencies for collaboration in burn planning to assist ESBS studies

