



 CHARLES  
DARWIN  
UNIVERSITY

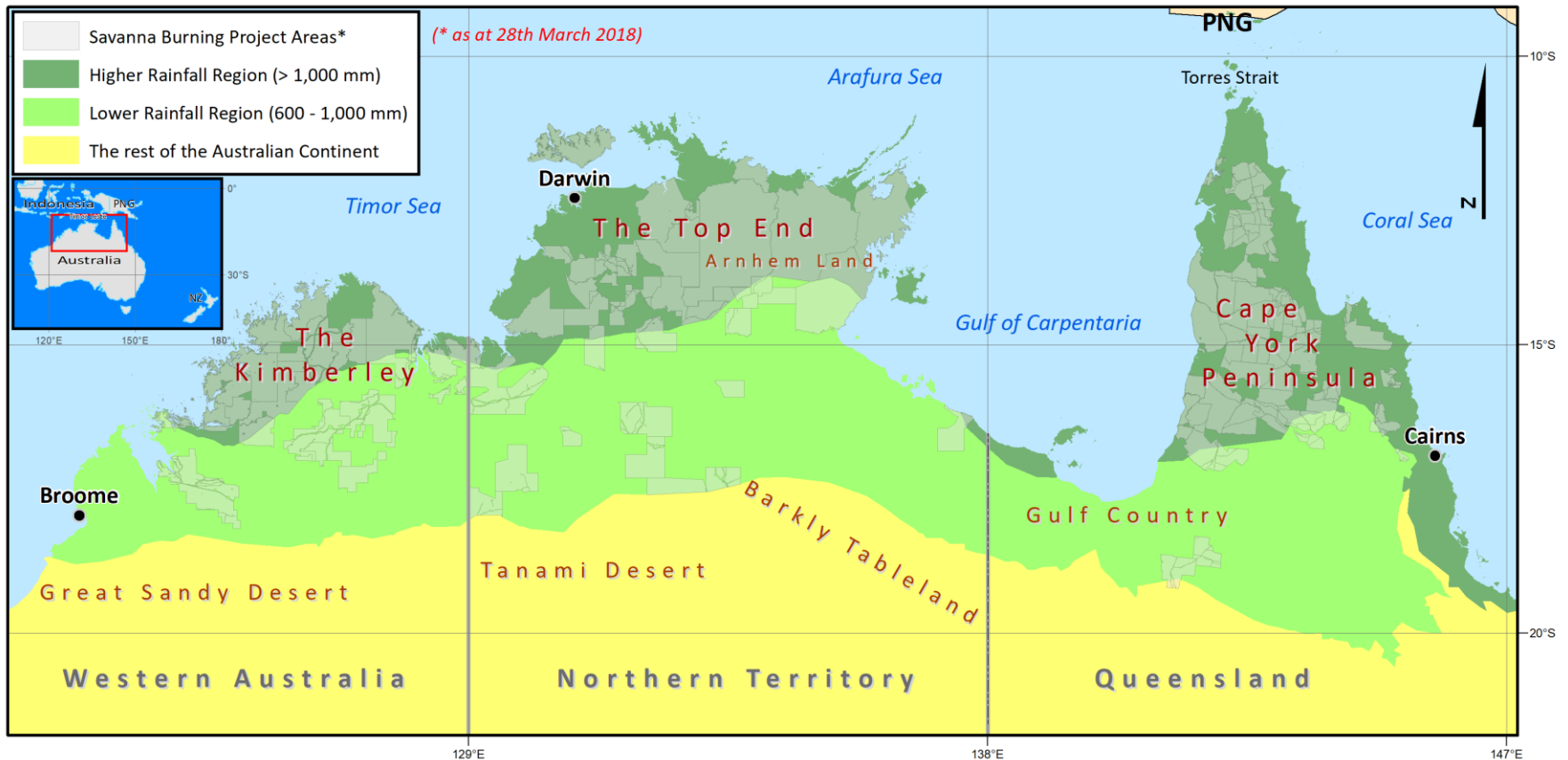


Darwin Centre for Bushfire Research  
Research Institute for Environment and Livelihoods  
Charles Darwin University

# Fire & Carbon

Dr Andrew Edwards

# The background.

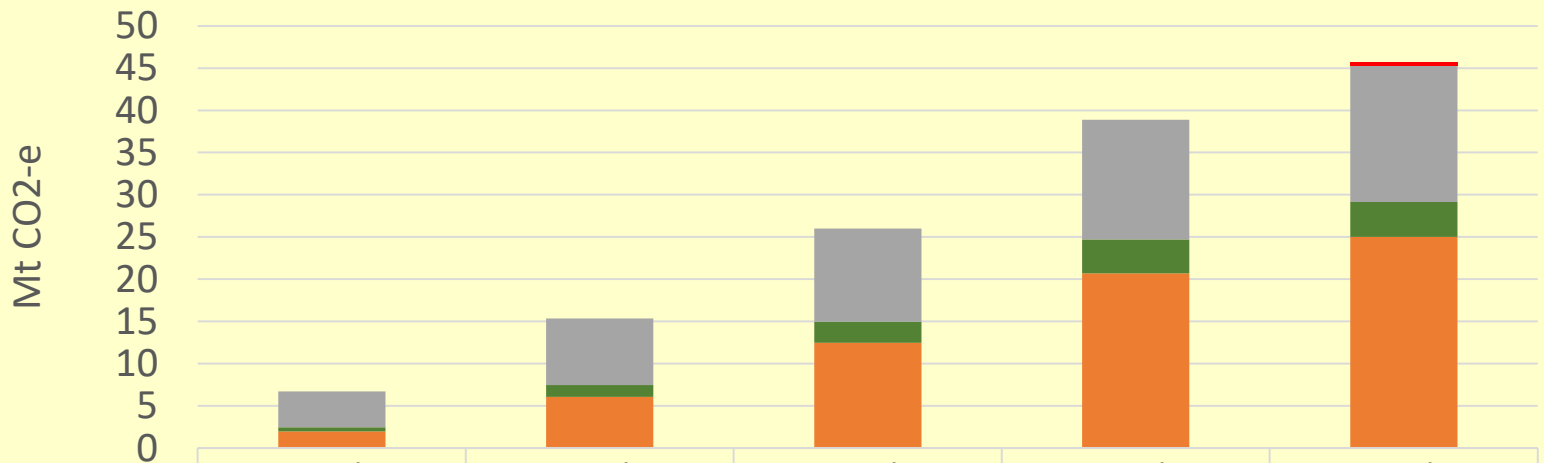




# The Background. Currently...

- 35 **Methods**
  - abated: 192 Mt CO<sup>2</sup>-equivalents abated.
  - 12.54 Mt from **Savanna Burning**  
(equivalents = methane and nitrous oxide)
- 78 **Savanna Burning Projects** (8 revoked)
- 4 million Australian Carbon Credit Units issued  
(average: @ \$15 = \$60 million dollars)

### Cumulative Credits Issued



	FY13/14	FY14/15	FY15/16	FY16/17	FY17/18
■ Agriculture					0.38
■ Waste	4.24	7.89	11.01	14.17	16.15
■ Savanna Burning	0.49	1.40	2.51	4.03	4.11
■ Vegetation	1.98	6.05	12.46	20.69	25.02

# What is Savanna Burning?

Created a means to calculate Greenhouse Gas emissions

Emissions Abatement =

Baseline (average emissions of 10-15 years) – Emissions in the project year (t CO<sub>2</sub>-e)



NAFI SavBAT 2.2  
Savanna Burning Abatement Tool - High and Low Rainfall

Australian Government

1. Welcome 2. Upload Map 3. Confirm Map 4. Select Process 5. Project Details 6. Results

## About SavBAT 2.2

Version 2.2 of the Savanna Burning Abatement Tool (SavBAT 2.2) automates GIS processes and mathematical calculations required to estimate greenhouse gas emissions abatement in accordance with the [Carbon Credits \(Carbon Farming Initiative—Emissions Abatement through Savanna Fire Management\) Methodology Determination 2015](#) (the Determination). SavBAT 2.2 is an enhanced version of SavBAT and includes:

1. Two mapping options for a project area or a potential project area:
  - a. The user uploads their own raster dataset for vegetation fuels type (see **Mapping Option A** below); or
  - b. The user uploads a vector boundary of their potential project area and the tool uses the government-supplied base map for vegetation fuel types (see **Mapping Option B** below). Note this map is not validated in accordance with the methodology requirements. Users should seek professional, independent advice about the data on this website and any entitlements or obligations in relation to a relevant program administered by the Department of the Environment.
2. Estimation of abatement for a hypothetical future year under different scenarios.

Version 1 of SavBAT must be used for projects using the [Carbon Credits \(Carbon Farming Initiative\) \(Reduction of Greenhouse Gas Emissions through Early Dry Season Savanna Burning—1.1\) Methodology Determination 2013](#) (ComLaw ID: F2013L01165).

### SavBAT 2.2 Requirements - Pre-prepared project data for vegetation fuel type:

As described, users either need to prepare and upload a vegetation fuel type map prepared in accordance with the Determination (Mapping option A), or instead they can upload a project boundary and use the supplied government vegetation fuel types base map (Mapping option B).

Both options use spatial products which need to be created externally from SavBAT 2.2.

- **Mapping Option A – User-created Raster Format Vegetation Fuel Type Map:**

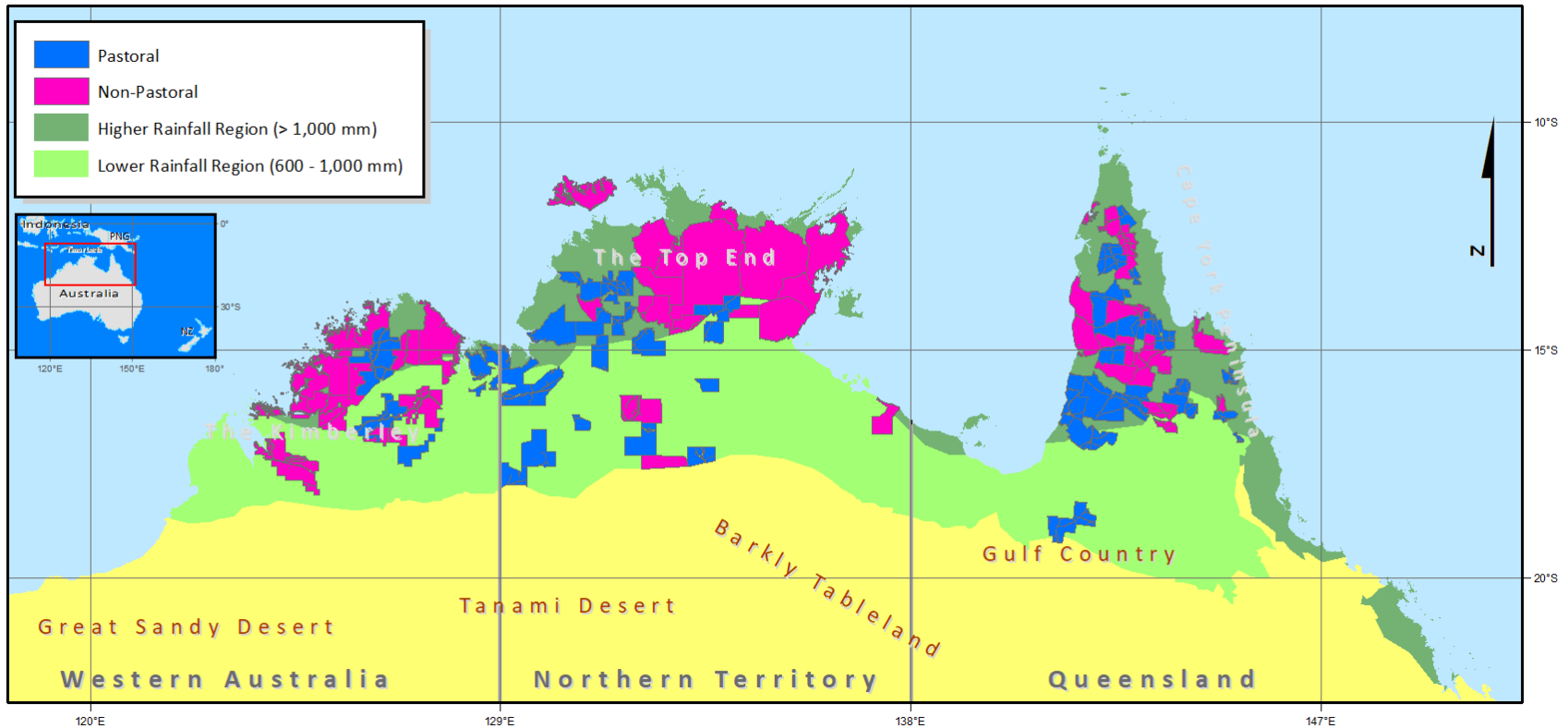
Requires a GeoTIFF with the format defined in the [SavBAT 2.2 User Manual](#). Projects may span the two rainfall zones, in which case the user's vegetation raster data must contain only the relevant vegetation fuel types for each rainfall zone. SavBAT splits the datasets and calculations for each rainfall zone before combining the results for the total baseline emissions.

I agree and next >

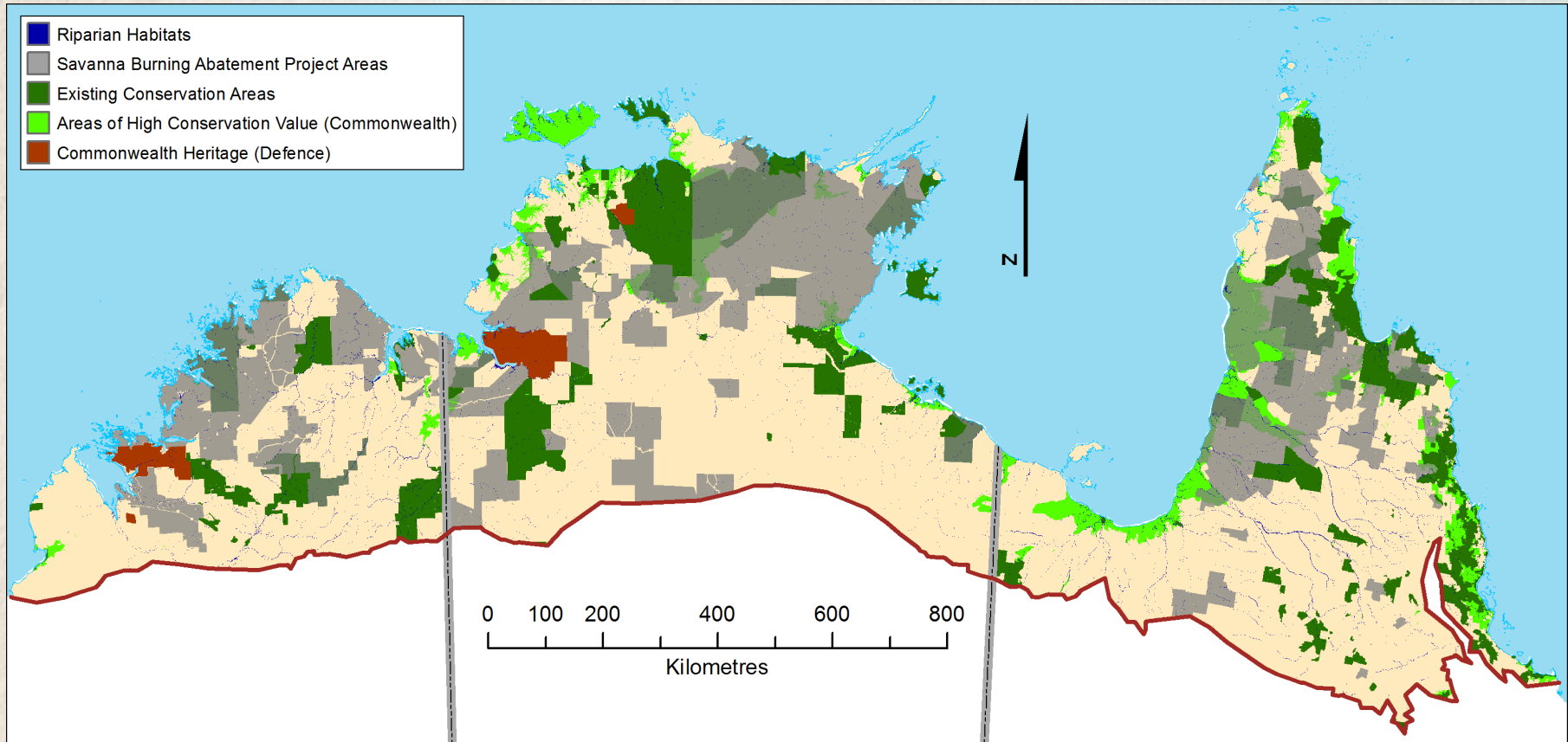


# Who's involved?

61% of project area is on Indigenous Land.



# The Conservation Estate





# The Fire & Carbon Forum





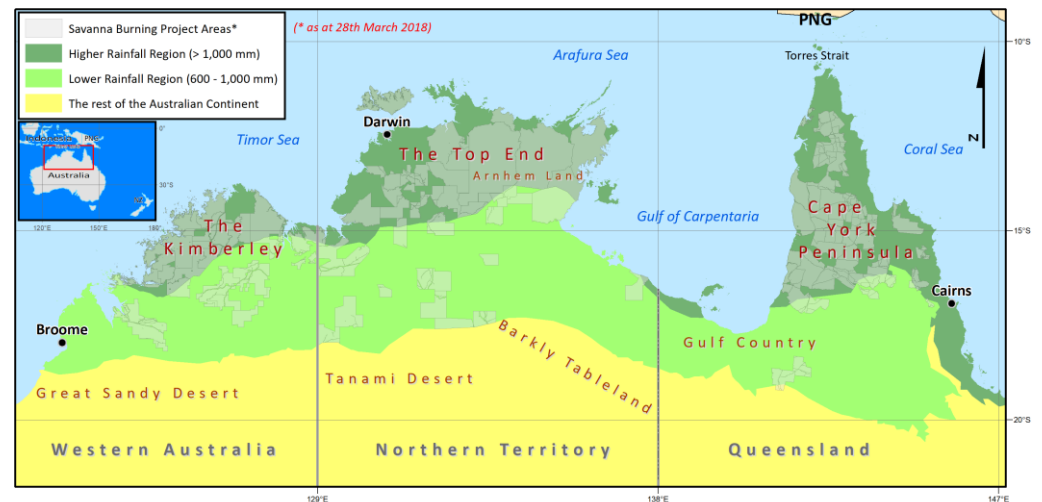
# Best Practice

- **What was the fire regime/management like beforehand?**  
*(i.e. extent of prescribed burning and wildfire, level of local (Indigenous) involvement)*
- **What is the fire regime and the fire management like now?**  
*(i.e. how much has wildfire been reduced; how many people are now involved in fire management; briefly, how do you undertake planning, prescribed burning, and wildfire suppression)*
- **What are the 3 most important challenges to your fire management?**
- **How do you currently deal with these 3 challenges?**  
*(i.e. What things contribute to good fire management outcomes?)*
- **How do you currently measure/monitor your practices and outcomes?**
- **Tell us the 3 main things that could be done to improve fire management.**  
*(e.g. Training: GIS/mapping, writing, scientific monitoring  
Organisational issues, Government issues, ...)*

# Best Practice

5 slides in 5 minutes:

Warddeken Land Management Ltd NT  
 Ban Ban Springs Pastoral NT  
 Thamarrurr Ranger Group [Western Top End] NT  
 Jawoyn Association NT  
 Nitmiluk NP NT  
 Kimberley Land Council WA  
 Parks BDCA WA  
 Australian Wildlife Conservancy WA  
 Wunambal Gaambera WA  
 Natural Carbon Qld  
 Batavia Qld





# Best Practice

The 10 project areas range in area from 3,000 to 28,000 km<sup>2</sup>, and spend between \$15 to \$40 per km<sup>2</sup>.

The most common **challenges** the groups stated they faced are:

- increased fuel loads, due to improved fire management, in highly fire-prone landscapes;
- affording and developing the capacity to suppress higher intensity wildfires;
- the low population, large areas and limited access (except, expensively, via chopper);
- having consistent funds to implement the programs;
- developing enough capacity and large enough teams to do the work;
- effectively monitoring and evaluating the effects of the new fire regimes;
- getting hung up on Carbon and not using traditional knowledge or good science;
- on non-Aboriginal land, competing land uses with different management requirements;
- and in WA, uncertain or restrictive State Government Policy around Climate Change, Carbon Taxing, and Carbon Rights.

# Best Practice

Some **Solutions** to the challenges were given:

- Traditional Owners need to be consulted and in control;
- on non-Aboriginal land, need more communication between stakeholders;
- need to engage both traditional and new knowledge systems;
- apply for funding through multiple streams;
- progressively acquire assets, build capacity and teams;
- improve access through building new ranger bases;
- on Park, developing and adhering to a Conservation Strategy;
- on Pastoral Lands, better communication between the various land use stakeholders;
- improve communications to develop more regionalised strategies;
- better inform the public of the importance of the Right Way Fire.





# Best Practice

Each of the groups provided some key points to define **Best Practice**:

- Right Way Fire – Proper and informed Traditional Owner consultation and ownership;
- Shift regimes from late to early dry season burning, to reduce fire intensity and impact, increase patchiness;
- reduce the total area burnt, to increase area longer unburnt;
- improve and maintain capacity and resources;
- monitor and evaluate the impacts of the change in fire regime on biodiversity.



# Best Practice

Finally, each of the groups provided a list of aspirations for the industry:

- More Rangers, with appropriate knowledge, training, skills, and resources;
- Improved technical information to monitor fires and receive information remotely;
- Good two-way consultation, between Rangers and Traditional Owners;
- Long-term sustainability of Rangers and funding;
- Two-way monitoring and evaluation techniques to inform the fire management;
- Better leadership on Carbon Rights.

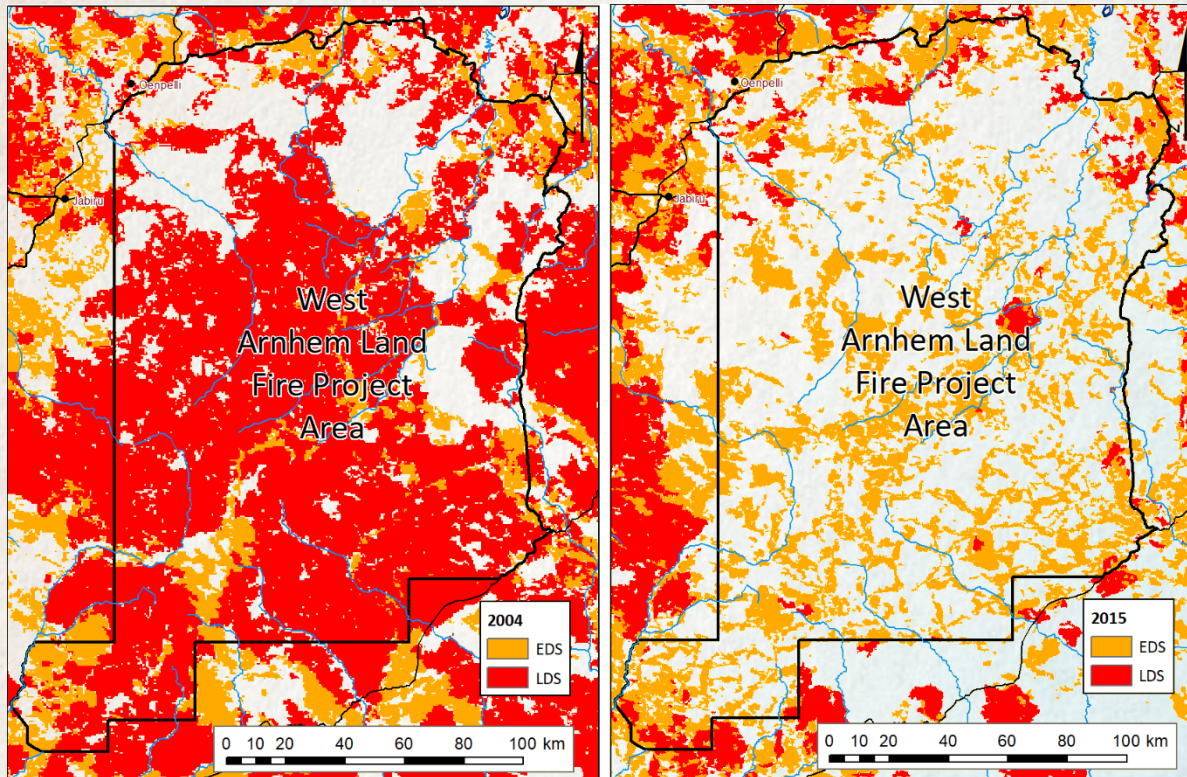




# Summary

- Fire regimes are changing the landscape;
- Continued and improved consultations with Traditional Owners and neighbours;
- Ignore Carbon, focus on Traditional Knowledge and Science;
- Appropriate Monitoring & Evaluation;
- Better Leadership on Carbon Rights.

# Fire Regime Change

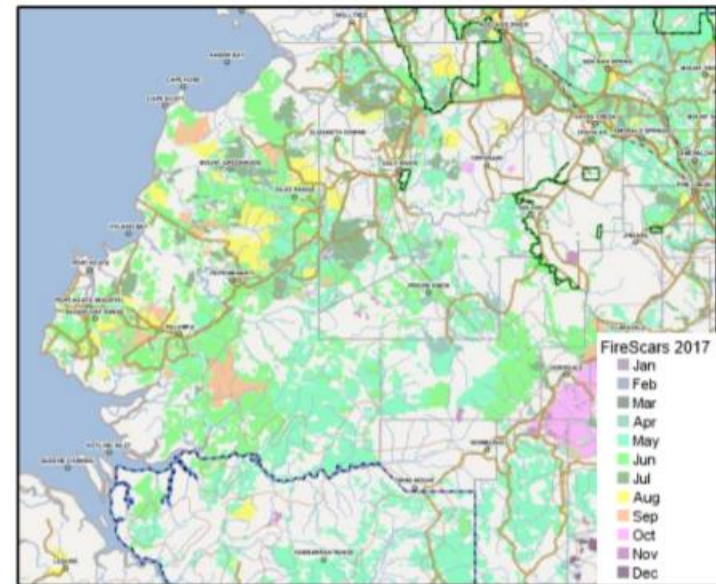
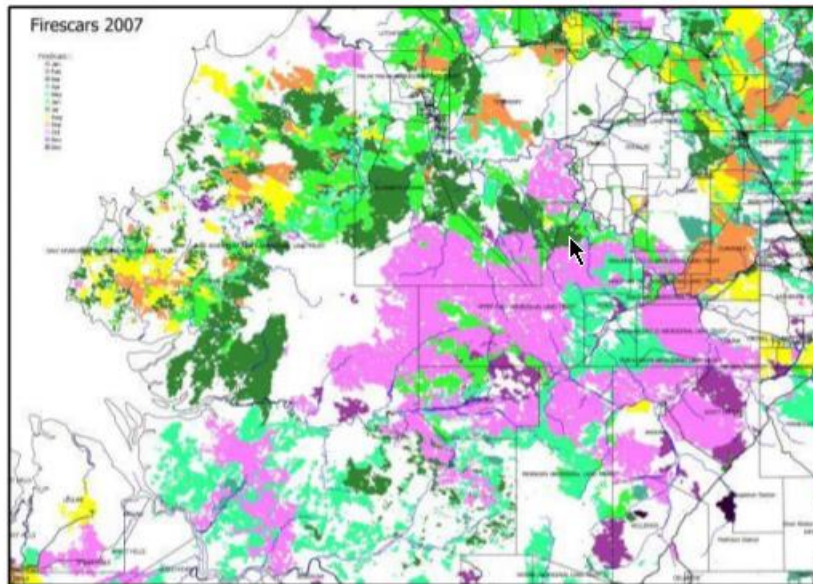


Burnt area mapping over the ~28,000 km<sup>2</sup> west Arnhem Land Fire Abatement (WALFA) project area. Early Dry Season (EDS) burnt areas are orange, Late Dry Season (LDS) burnt areas are red: (a) 2004, illustrates the period at the commencement of improved fire management, some EDS burning has been undertaken, the, previously typical, large LDS fires sweep across the Arnhem Plateau, devastating biodiversity and; (b) a more recent and now typical improved fire management outcome, depicting strategic fire breaks able to contain LDS ignitions, somewhat, till suppressed. All data available at [www.firenorth.org.au](http://www.firenorth.org.au). Regional centroid: 133E, 13S.



# Fire Regime Change

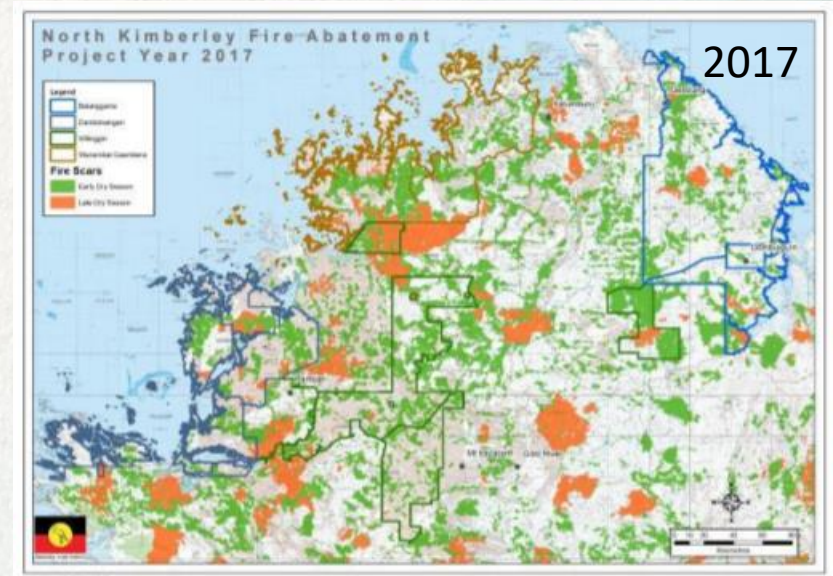
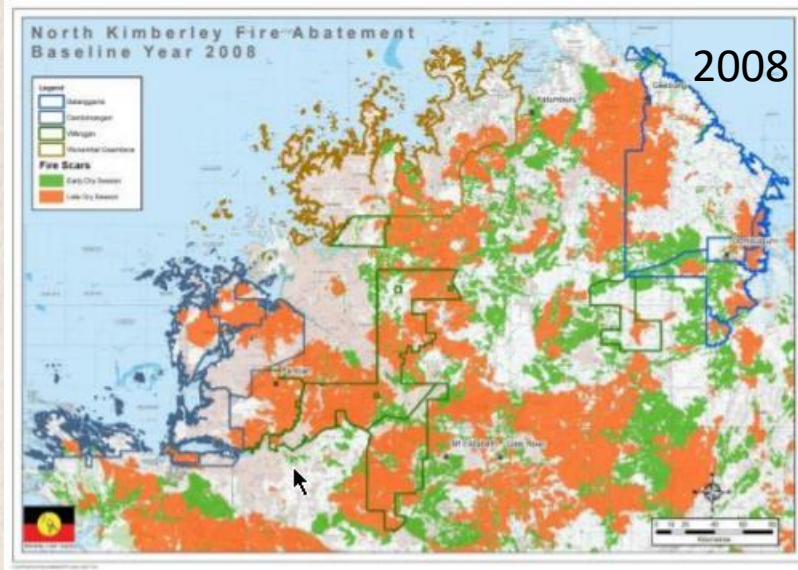
## Past & Present Fire Regimes



**Western Top End**



# Fire Regime Change



**Kimberley**



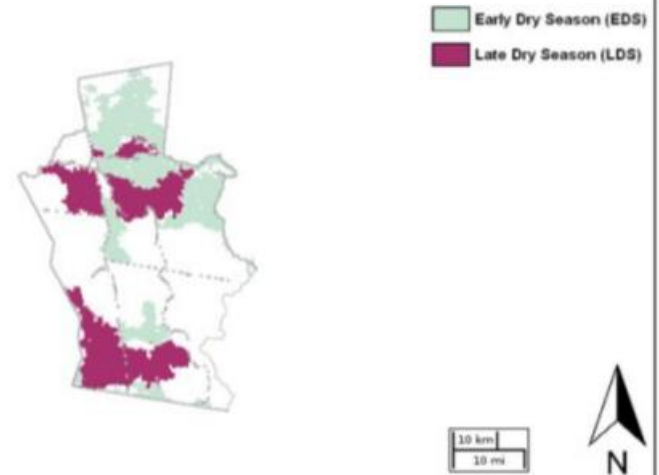
# Fire Regime Change

2012



**Batavia, Cape York**

2017



# References

<https://bushfiresresearch.wordpress.com/>

[www.firenorth.org.au](http://www.firenorth.org.au)