

PROCEEDINGS OF THE AUSTRALIAN RANGELAND SOCIETY BIENNIAL CONFERENCE
Official publication of The Australian Rangeland Society

Copyright and Photocopying

© The Australian Rangeland Society. All rights reserved.

For non-personal use, no part of this item may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without prior permission of the Australian Rangeland Society and of the author (or the organisation they work or have worked for). Permission of the Australian Rangeland Society for photocopying of articles for non-personal use may be obtained from the Secretary who can be contacted at the email address, rangelands.exec@gmail.com

For personal use, temporary copies necessary to browse this site on screen may be made and a single copy of an article may be downloaded or printed for research or personal use, but no changes are to be made to any of the material. This copyright notice is not to be removed from the front of the article.

All efforts have been made by the Australian Rangeland Society to contact the authors. If you believe your copyright has been breached please notify us immediately and we will remove the offending material from our website.

Form of Reference

The reference for this article should be in this general form;

Author family name, initials (year). Title. *In*: Proceedings of the *n*th Australian Rangeland Society Biennial Conference. Pages. (Australian Rangeland Society: Australia).

For example:

Anderson, L., van Klinken, R. D., and Shepherd, D. (2008). Aerially surveying Mesquite (*Prosopis* spp.) in the Pilbara. *In*: 'A Climate of Change in the Rangelands. Proceedings of the 15th Australian Rangeland Society Biennial Conference'. (Ed. D. Orr) 4 pages. (Australian Rangeland Society: Australia).

Disclaimer

The Australian Rangeland Society and Editors cannot be held responsible for errors or any consequences arising from the use of information obtained in this article or in the Proceedings of the Australian Rangeland Society Biennial Conferences. The views and opinions expressed do not necessarily reflect those of the Australian Rangeland Society and Editors, neither does the publication of advertisements constitute any endorsement by the Australian Rangeland Society and Editors of the products advertised.



The Australian Rangeland Society

‘Stacks of Fire - Implementing a Fire Management Program Mount Isa Mines’

K. Masters Xstrata Zinc Mount Isa Mines PMB 6 Mount Isa Qld 4825, Australia Email: kmasters@xstratazinc.com.au

How does a mine site environmental advisor convince a mine manager to let them light a fire within a few hundred meters of two fresh air intakes of an underground mine, a 320 man camp and a massive crushing facility construction project? Letting them play with a drip torch helps but getting it right with the right project planning and people and then not disrupting production is the best method. The 66 640km² Mount Isa Inlier bioregion in north western Queensland is typified by rugged red rocky hills, low open woodland of spinifex and snappy gum and is the location of the Xstrata Mount Isa Mines copper, lead and zinc open cut and underground mining and processing/smelting operations. A biodiversity assessment conducted in 2009 identified that wildfire was a significant threat to the biodiversity of the 32,000ha Mining Lease. Other research including habitat and distribution surveys of the fire sensitive Carpentarian and Kalkadoon grasswrens found that wildfires were extensive across the bioregion and threatening these species. Xstrata Mount Isa Mines developed a lease wide Fire Management Plan with the inclusion of neighbouring pastoral properties to implement hazard reduction and infrastructure protection. The first round of the on ground burning program was successfully completed in March 2012 with six strategic burn areas. Parameters that attributed to the high rate of success with this program included no mine shut downs or production interference during the burns and a high degree of stakeholder involvement including neighbouring pastoral property managers; scientifically sound burning techniques including weather conditions for cool burns and ratio of area burnt / unburnt allowing for increased habitat regeneration and retention.

Key words:- planning, communication, controlled burning

Introduction

The Xstrata Sustainable Development Framework Standard 10 is based around implementing scientifically sound technologies and procedures are developed and implemented for the effective management and conservation of biodiversity and landscape functions.

Fire is the key threat to the integrity of the biodiversity on the mining Lease and Xstrata is responsible for managing the Lease land. In the last seven years several moderate to large fires have occurred in the areas surrounding the lease (Figure 1). The fire patterns show fires stop in spinifex areas which have been recently burnt as it takes several years for the fuel load to carry a fire. The most recent large wildfire in the north-west included an area of “Of concern” Silver ironbark shrubland. Many areas have been long unburnt whilst of benefit to fire sensitive flora and fauna the risk of wildfires is enhanced.

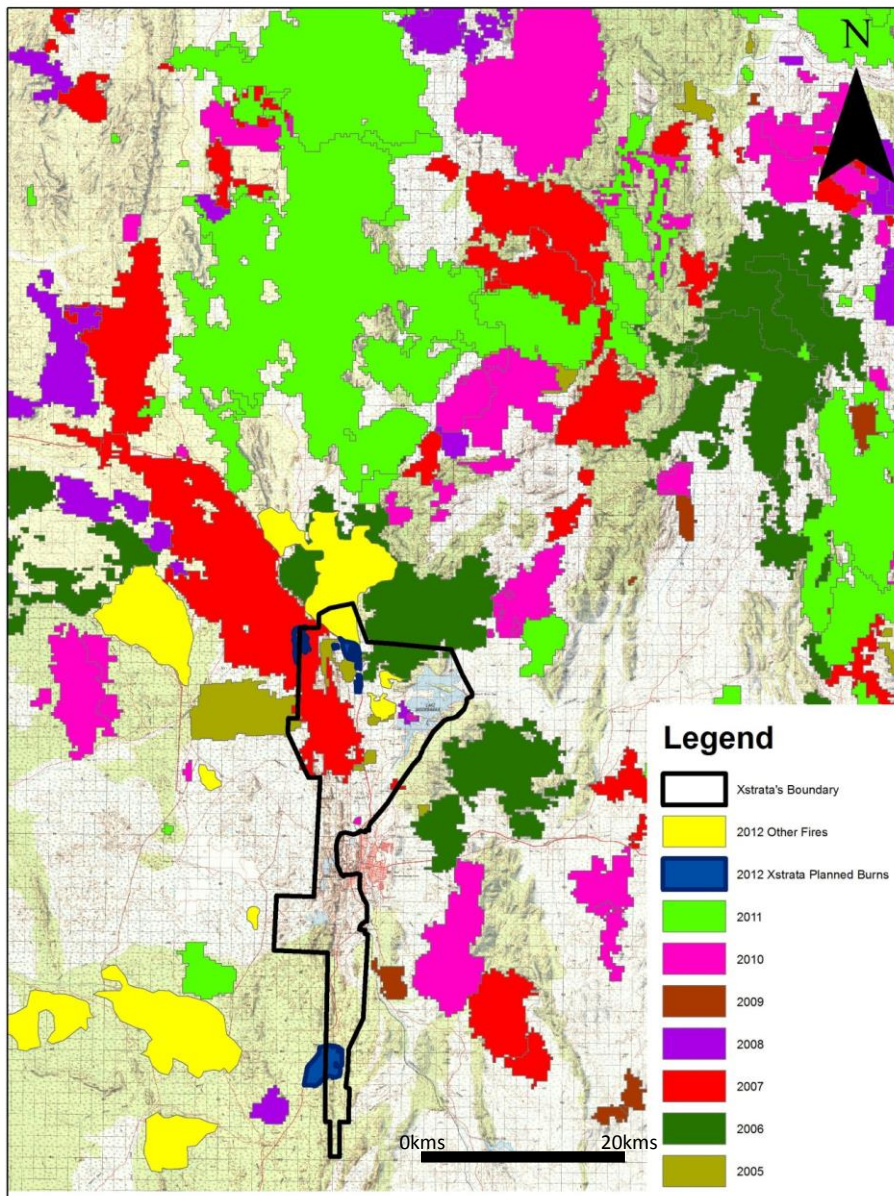


Figure 1: Recent fires on and near the Lease. (North Australian Fire Information, and on-ground mapping)

The Lease is within the Mount Isa Inlier bioregion (Figure 2); a rugged landscape of complex geology and infertile shallow soils. The dominant vegetation is a low open woodland of trees and shrubs namely Eucalyptus, Corymbia and Acacia, with *Triodia* spp. ground cover. On the sandy and alluvial plains areas of gidgee (*Acacia cambagei*) along with grasses:- black spear; kangaroo; buffel occur. There are 18 ecosystems which are split into fire management groups:- open woodlands; open woodlands on rocky outcrops and ridges; gidgee and riparian forest (fire sensitive). Repeated and extensive fire in an area of gidgee is showing signs of damage while maintenance is ideally achieved through patchiness of time since last burn especially in snappy gum. Rare fauna such as the Carpentarian grasswren prefers dense spinifex which develops after long fire-free intervals.

The region is a warm to hot throughout the year semi-arid climate with strong seasonal wet-dry pattern and average annual rainfall of 477mm which can be highly variable between years.

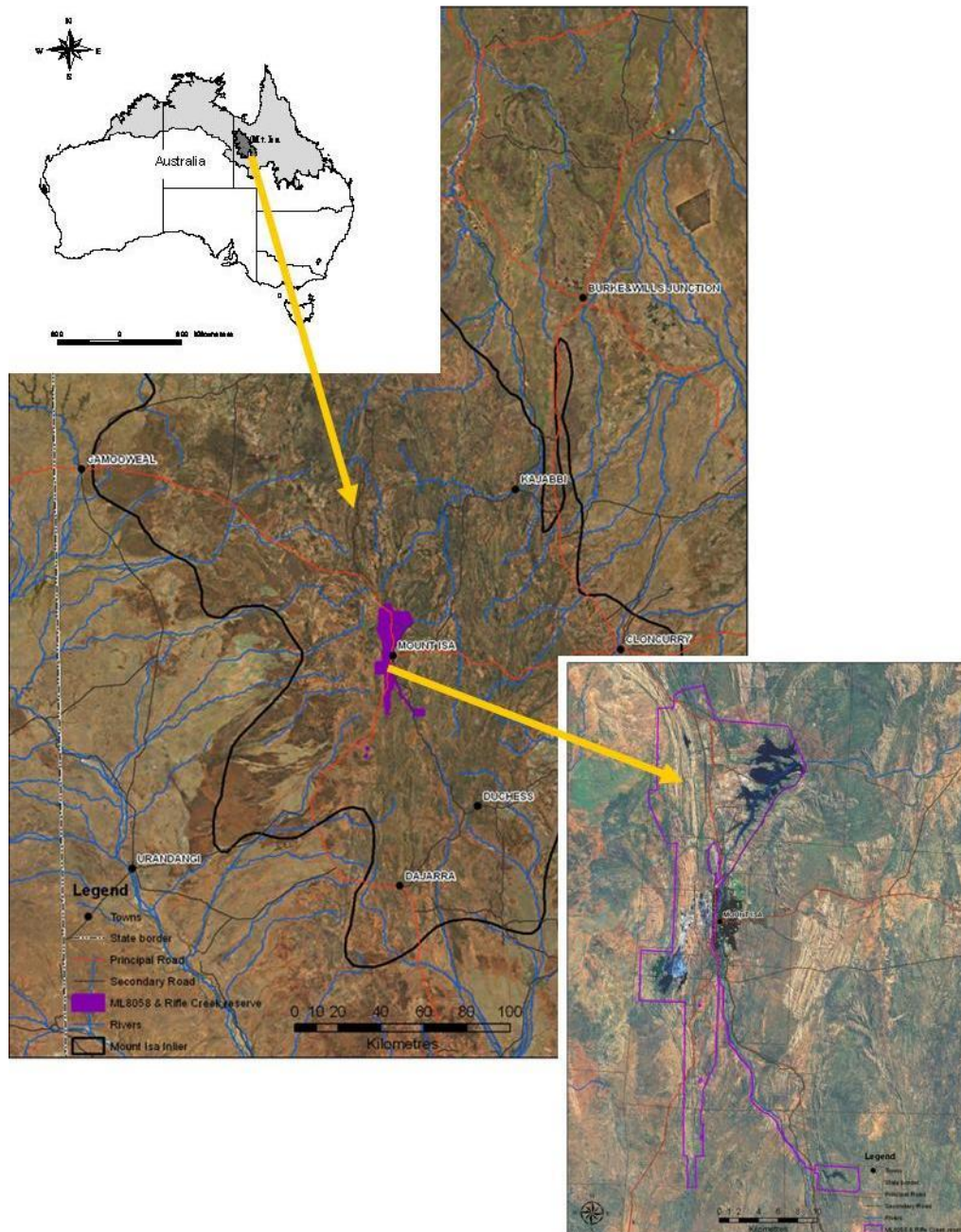


Figure 2: Location of the Mount Isa Inlier and the Lease

Background

In 2010 a five year Lease wide fire management plan was developed using the Lease vegetation and fauna information and extensive engagement with stakeholders:- Xstrata utilities and emergency services departments; Southern Gulf Catchments; Kalkadoon Community; Rural and Metropolitan Fire Brigades; neighbouring stations (Figure 3); the airport; Queensland Government; Bureau of Meteorology, Mount Isa Water Board; Main Roads, Ergon Energy and the Mount Isa City Council to identify fire management needs.

Fire management plan aims:-

- Protect life and property by creating a burnt break in the north-west, Indigenous cultural sites;
- Ensure the long term conservation of native species and communities

This is achieved by:-

- Mitigating the risk of wildfire by creating a mosaic of recently burnt and long unburnt patches;

- Engaging with surrounding properties on ecological, cultural and pastoral requirements of fire strategies;
- Establishing monitoring sites to measure success



Figure 3: Overlay of Mount Isa Mining Lease 8058 on pastoral leases

Methods

Burn Management Areas are established based on tracks and watercourses for containing fires, infrastructure and ecosystem arrangement. These are further defined with Burn Implementation Plans. Burning is conducted during the wet season and only after decent rain, in low wind and high humidity conditions to ensure a slow cool burn of 40-80% of the area. Ignition is done by aerial incendiary (condys crystals filled pingpong balls injected with glycol) or by drip torch onground.

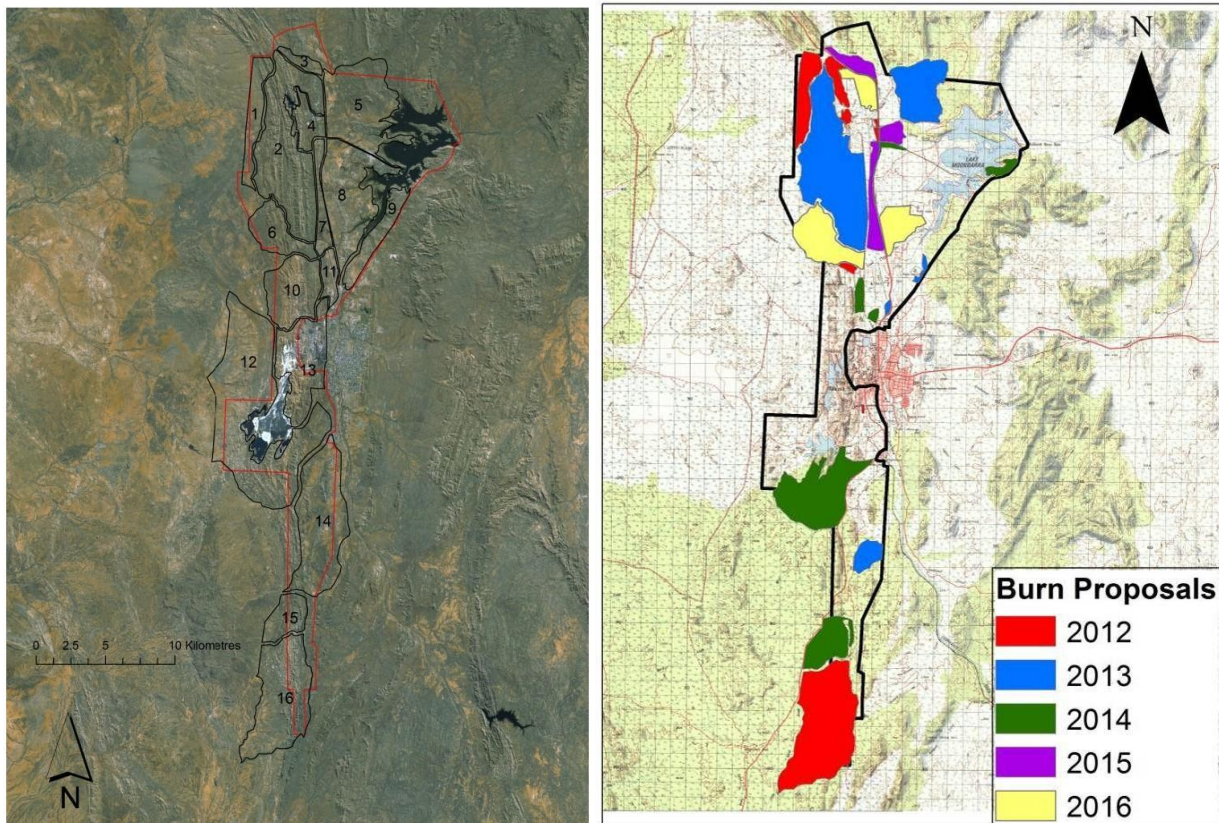


Figure 4: Burn management areas (L) and suggested 5 year burn program (R)

The program for the 2011/2012 wet season was six burns.

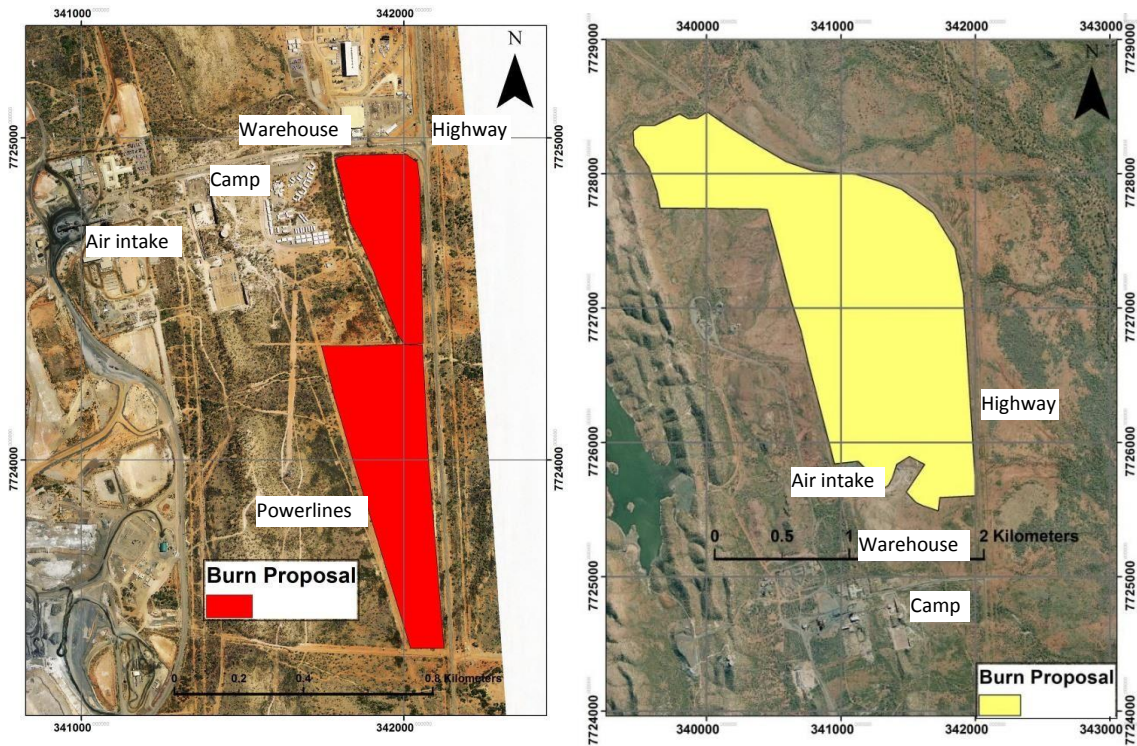


Figure 5: Burn Implementation areas 5 (L) and 4 within burn area 2. Infrastructure protection in long unburnt area

Both these burns are within close vicinity of infrastructure (warehouse, crushing plant, 320 man camp, several high voltage powerlines, highway) and underground mine fresh air intakes.

Implementation

- Ongoing with spot ignition drip torch against the wind
- Numerous meetings with operations managers to discuss the why and how managed and identify production issues (burning on weekends only)
- Grading of breaks and under powerline

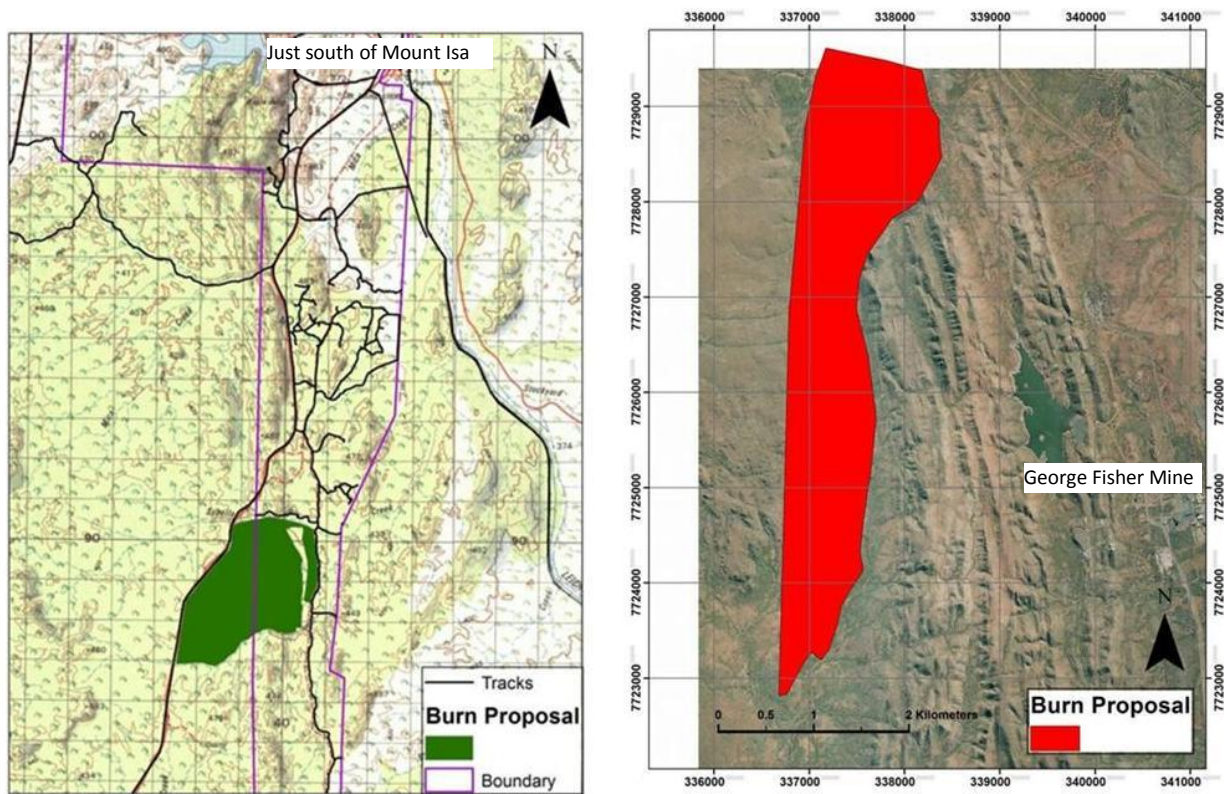


Figure 6: Burn Implementation Plans 7 (area 15) and 1 (Area 2). Ecosystem maintenance

Implementation

- Spot aerially incendiary
- Numerous meetings with landholders (both participated fully and conducted own other burns)

General

- Permit and notifying FireCom
- All staff notices and public notices in the paper of activities

Results

The burns were completed without suspending operations of the mine and the patchiness within the implementation areas was obtained and protection of infrastructure achieved due to reduction in fuel loads. The planned burns were conducted shortly after rain > 30% humidity and < 15 knot winds and spot ignition. Prior to the commencement of burns 4 and 5 a continuous line panic back burn was lit in >15knot wind, 43°C and 5% humidity in an attempt to stop a large wildfire heading south towards the mine.

This higher intensity panic back-burnt wildfire caused damage to the trees and consumed all of the grass layer and organic duff layer. Leaf litter and organic material ground cover declined from an average of 12% to 7%. Whereas the planned burns were patchy with less canopy scorch with in increased ground over from an average of 6% to 26%.



Figure 7: Transect 7 Snappy Gum (burn area 3) before panic burn (L) after the panic burn (R)



Figure 8: Transect 2 (burn area 4) Snappy Gum before the controlled burn (L) and after the controlled burn (R)

All fires increased the diversity of the grasses and herbs, by promoting seed germination. Herbs that were commonly promoted by fire were the legumes *Indigofera colutea*, *Senna notabilis* and *Tephrosia virens*. Native grasses promoted by fire include the annual *Sporobolus australasicus* and the perennial *Cymbopogon bombycinus*.

Conclusions

Engagement and planning is the key to the success of the first round of the fire management project on the Lease. Conducting burns in the right weather conditions is the ideally way to achieve the desired outcome of patchiness and improving the ecosystem.

Acknowledgements

Thanks Dr Leasia Felderhof (Firescape Science), Dr Paul Williams (Vegetation Management Science), Mick Blackman and crew (Friendly Fire) for their total professionalism throughout project.

Acknowledgement to Xstrata Mount Isa Mines (especially Rob Walker George Fisher Mine Manager who had a grader, bulldozer and water cart on standby – a bit nervous!), for approving the project; the neighbouring landholders for their willingness to participate and the stakeholders of the Mount Isa area. Special mention to Julie Boyer Manager SD Xstrata Zinc, for having my back.

Reference Material

Felderhof, L. (2007). *The Fire Patchiness Paradigm: A Case Study in Northwest Queensland*. PhD Thesis. JCU.

Murphy S., Harrington G. and Felderhof L., 2011, *Preliminary spatial model using fire scar data to monitor Carpentarian Grasswrens* unpublished

Southern Gulf Catchments, 2009, '*Biodiversity Assessment of Mount Isa Mines Mining Lease ML8058*' chapter authors Williams P. And Felderhof L.' unpublished

Southern Gulf Catchments, 2007, '*Best Practice Fire Management in the Greater Mount Isa region. Prepared by Dr Lesie Felderhof*' unpublished

Xstrata Mount Isa Mines, 2010, '*Fire Management Plan. Prepared by Dr Lesie Felderhof and Dr Paul Williams*' unpublished