

# **EAST KIMBERLEY FIRE PROJECT MANAGEMENT PLAN 2009/10**





## Table of Contents

	<b>Page</b>
Management Plan	4
Background	5
Community and Stakeholder Engagement	5
Priority Fuel Reduction Areas	6
Fuel Reduction Methods	8
Burning Programs	8
Demonstration Site	14
Appendix 1	16
Appendix 2	22

This project was funded by the Rangelands NRM using Caring For Our Country funding. Rangelands NRM regard this project as a strategic investment which will contribute to the improved management of fire in the East Kimberley.

Funding for Caring For Our Country was provided by the Australian Government.

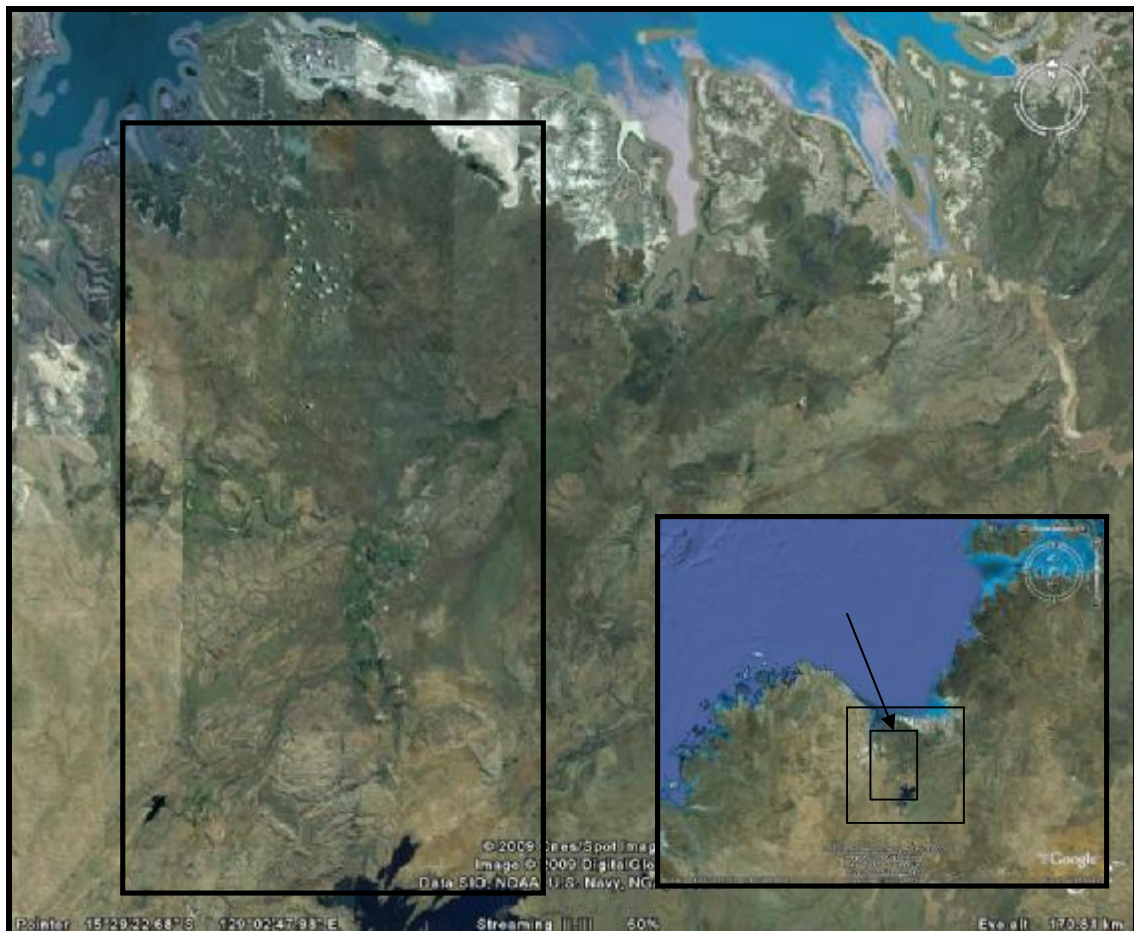
## East Kimberley Fire Project Management Plan 2009

This Management Plan has been developed as part of the Rangelands NRM East Kimberley Fire Project and is funded by the Federal Government Caring for Our Country program.

The project seeks to extend on the 'Ecofire' concept being undertaken in the central Kimberley by providing resources for early seasonal burning to protect environmental assets and coordinating that program with other existing programs within the Kununurra area.

The development of a Fire Management Plan for the project contributes to the projects objectives by –

- ✚ Increasing awareness of the threat and extent of fires within the region
- ✚ Identifying through community engagement areas of potential biodiversity significance and how best they can be protected.
- ✚ Implement a burning program to protect identified assets.
- ✚ Develop and encourage cross organisation communication and collaboration.



Project location East Kimberley

## Background

Wildfire, particularly extensive, hot, late season fires are considered to have increased significantly in recent times within the East Kimberley. This is believed to be having a negative impact on pastoral enterprises, Aboriginal cultural sites, communities and biodiversity values.

Land managers – including pastoralists, Aboriginal people, Department of Environment and Conservation and the Shire, currently do not have the resources to deal effectively with all wildfires, particularly those in isolated areas that are left to burn themselves out or are not managed until they threaten infrastructure, grazing land or National Parks.

**Where do fires come from?** This is largely dependant on the time of year, the fire scar data collected from 2006 – 2008 for this project (see appendix 1) has been broken down into three seasonal periods –

**Early Season** (January - June): Burning at this time is usually done to remove wet seasonal growth for improved pastoral production and to reduce fuel loads in the event of late season fires that may threaten the area. The burns are often cool, slow moving and primarily subject to residual vegetation moisture and high night time humidity levels that combined will often extinguish the fire. They leave areas unburnt within the fire affected area giving a mosaic of 40% or under and are considered in most cases to be a fuel reduction burn. Generally they are considered to have a minimal effect on the environment when compared to fires of the mid and late season.

**Mid Season** (July – September): Burning at this time is often at the result of accidental or deliberately lit unauthorised fires. They burn with much more intensity than early season fires and are primarily subject to the low humidity levels, strong seasonal winds little or no residual vegetation moisture. They most often will not go out overnight and are capable of burning for many days covering large areas of ground. The areas unburnt within the fire affected area are reduced, the mosaic affect being above 40%. They are considered to be a wildfire. Their effect on the environment is much more severe than early season fires and can be a danger to both life and property. It should be noted within the fire scar data that mid season fires are focussed on areas not burnt previously during the early season.

**Late Season** (October – December): Burning at this time is generally a mixture of unauthorised fires and lighting strikes. This is reflected in the fire scar data by the more even spread of fires across the landscape. High humidity and in some cases rain can influence the intensity of these fires so environmental impacts are extremely variable but are considered to be wildfires.

## Community and Stakeholder Engagement

**Carlton Hill Station:** As the main landholder within the project area Carlton Hill Station was engaged at the earliest opportunity. Two meetings were held in November 2008 and again in February 2009 to discuss the project, fire scar data and likely burning strategies for 2009. A later meeting in April consolidated a collaborative burning strategy between Ord Land and Water and Carlton Hill Station for the aerial burning program. A further meeting was held in August 2009 to facilitate discussions between Carlton Hill Station

and the Department of Environment and Conservation. It was agreed that both parties would work together collaboratively for the life of the project and regular communications would be maintained.

**Keep River National Park:** Meetings was held with the manger of the Keep River National Park to identify opportunities to coordinate burning programs close to the NT/WA border that provided mutual protection. It was agreed that both parties would work together collaboratively for the life of the project and regular communications would be maintained.

**Volunteer Fire Brigades:** Meetings were held in March 2009 with Ivanhoe and Crossing Falls Volunteer Fire Brigades. At these meetings fire scar data was presented to give an overview of fire frequency. From the meetings an agreement was gained that would see the Brigades burn as part of their annual program areas that would protect environmental assets being identified in a separate but concurrent process.

**DEC and MG Park Council:** At least two meetings were held with both organisations, separately or together. Discussed was to possibility of using Park Rangers to carry out some early burning work around various Indigenous communities. It was agreed that all parties would work together collaboratively for the life of the project and regular communications would be maintained.

**Technical Group and Bushfire advisory Committee:** Several meetings were held with the Technical Group to seek advice and detail organisation burning plans and associated processes. This group was later replaced by the Bushfire Advisory Group, a pre-existing organisation made up of the same key stakeholders.

**FESA, DAF, SWEK, Mainroads WA:** Several meetings were held with these groups to seek advice that could be incorporated into the development of the plan.

**Community:** A workshop and a number of ‘one on one’ meetings were held in March 2009 to identify and prioritise sites considered to be of environmental value within the project area (see priority list and maps Appendix 2). These sites would be the focus of the project fire management activities.

## **Priority Fuel Reduction Areas**

Throughout the consultation process it was identified that deliberately lit mid season fires were considered to be the primary threat. These were usually fanned by seasonal south-easterly winds and had the greatest capacity to cause both environmental and infrastructural damage. From that, the input identifying the environmentally valuable sites and the priorities of other organisations involved in fire prevention the following actions would take place for 2009 and 2010.

**Roads and Tracks:** Many fires are known to be started from the edges of roads and tracks. Priority will be given to reduce fuel loads through early season burning along the down wind side (north and west) of roads and tracks adjacent to environmentally sensitive areas. Proposed sites include –

- ✚ Areas off the Victoria Highway west of Kununurra.
- ✚ Fish Farm Road.
- ✚ Crossing Falls Road.

Priority sites to be protected in this strategy include -

- ✚ Reserve: Mirima National Park 2,063 ha.
- ✚ Reserve: Weaber Range 29,149 ha
- ✚ Wetland Site: 1 Fishfarm Road 219 ha.
- ✚ Riparian area: Site 6 Lake Kununurra 609 ha.
- ✚ Rocky outcrop: Site 2 Maxwell Plain 520 ha.
- ✚ Rocky Outcrop: Site 8 Mirima north 1,021 ha.
- ✚ Rocky outcrop: Site 9 Lost City 185 ha.
- ✚ Shrubby site: Site 4 Kununurra 243 ha.

**Existing fencelines and Fire Breaks:** Fire breaks along fencelines and tracks will generally not stop the movement of wildfires. However their value is as a ‘jump off’ point to back burn into the face wildfires to protect areas of value behind the break. Controlled burns due to their nature will often halt on a fire break, therefore reducing the fuel load with a controlled burn off a fire break in the path the most likely direction of a mid or late season fire can be extremely beneficial.

Priority will be given to reducing fuel loads on the up wind side (south and east) of fire breaks in front of environmentally sensitive areas. The proposed site for work is the Knox Creek Paddock fence line east of Kununurra (See Map 1 for location).

Priority sites to be protected include -

- ✚ Reserve: Mirima National Park 2,063 ha.
- ✚ Rocky Outcrop: Site 8 Mirima north 1,021 ha.
- ✚ Rocky outcrop: Site 9 Lost City 185 ha.
- ✚ Shrubby site: Site 4 Kununurra 243 ha.

**Other areas:** There were a number of areas identified where a controlled burn would plug a gap between natural, features, roadways and other burning programs giving better protection to environmentally sensitive areas. Proposed sites include –

- ✚ A corridor of land in the Knox Creek Paddock that remained unburnt in the 2008 season. This action along with the burn along the paddock’s eastern fence line would break the area up into cells to protect grazing area, Mirima National Park, the townsite and associated communities as well as environmental assets. (See Map 1 for location).
- ✚ A section of land to the west of the Keep River and to the south of the Legune Road to protect the Keep River National Park from late season fires (See Map 1 for location).
- ✚ An area of land between Weaber Road and the Abney Hill/ Mirima Range. This area was selected in particular to protect the portion of land north of Abney Hill where the Shire of Wyndham East Kimberley have been doing some remediation work on waterways to reduce rapid erosion events thought to have been caused, in part by loss of vegetation due to fires (see Site 8 in Map 4).

Priority sites to be protected include -

- ✚ Reserve Mirima National Park 2,063 ha.

- ✚ Reserve Pincombe Range 17,898 ha.
- ✚ Reserve Septimus 14,317 ha.
- ✚ Reserve Ningbing 21,749 ha.
- ✚ Reserve Weaber Range 29,149 ha
- ✚ Mound spring Site 13 Boab Spring.
- ✚ Mound spring Site 14 Snake Spring.
- ✚ Mound spring Site 15 Bamboo Spring.
- ✚ Mound spring Site 16 King Gordon Spring.
- ✚ Mound spring Site 17 Bull Spring.
- ✚ Mound spring Site 18 Gladys's Spring.
- ✚ Mound spring Site 19 Leichardt Spring.
- ✚ Callitris outcrop Site 10 Ningbing east 1192 ha
- ✚ Callitris outcrop Site 12 Carlton north 5528 ha
- ✚ Rocky Outcrop Site 8 Mirima north 1,021 ha.
- ✚ Rocky outcrop Site 9 Lost City 185 ha.
- ✚ Shrubby site: Site 4 Kununurra 243 ha.

## **Fuel Reduction Methods**

**Aerial burning:** This method will take advantage of the FESA aerial pastoral burning program, which is managed by FESA and provided to Kimberley pastoral stations. All aerial burning will be done on Carlton Hill Station and in consultation with the Station Manager. Burning will be done from a helicopter following prescribed track lines with a FESA officer managing the burn process.

**Ground Burning:** This method will utilise and be done in conjunction with the Crossing Falls and Ivanhoe Volunteer Bush Fire Brigades own fuel reduction programs. It will focus on areas close to Kununurra and communities where an increased management of the burning process is required.

Each participating Brigade will be paid on a fee for service basis for work done as allowed by associated regulations.

**Intended outcome:** Is to have an approximate 20 to 40% mosaic within the target area.

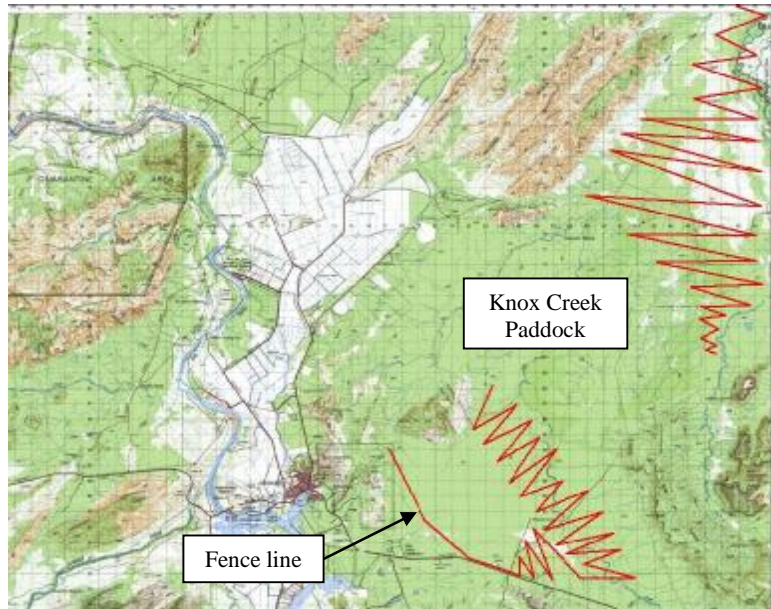
## **Burning Programs**

**2009 aerial program:** Based on the identification of priority areas 55,000 hectares of land on the Knox Creek Plain east of Kununurra was selected for a controlled burn. This would be done in conjunction with FESA and Carlton Hill's own early season burning program to the north.

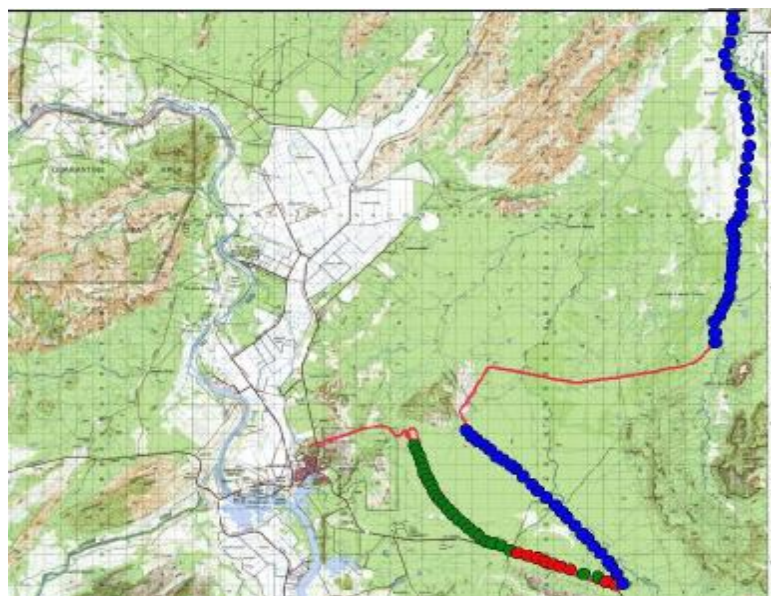
**Outcome:** An initial burn was carried out on the 25<sup>th</sup> April 2009. The results of the burn were mixed. Even though the burn was done in late April much of the ground would not carry a fire. Map 2 shows the track line taken and the result of the burn. Areas marked green close to the townsite did not burn at all, due to the vegetation still not cured. With over 500 mm of rain falling in January/February ground moisture levels were still too high. The red areas show where the fire was the most effective as it ran parallel to the Victoria Highway and the Carlton fence line. Finally the Blue areas show where the fire

had mixed results. High humidity on the day and some scattered rain in the afternoon as well as residual soil moisture hindered the burn.

A further burn was planned mid May but with the onset of strong seasonal winds Carlton Hill pulled out of any further aerial burning so the program was called off for 2009.



Map 1: Proposed approximate track for aerial burn 25<sup>th</sup> April 2009



Map 2: Burn efficiency of aerial burn 25<sup>th</sup> April.

Green: nil burn.

Blue: partial burn.

Red: effective burn.

Map 3 shows the mixed results of the burn with no fire surviving to be picked up by satellite on its pass over, cloud and some rain may have also obscured some of the hot spots. The burnt areas in purple is from a later fire in November 2009



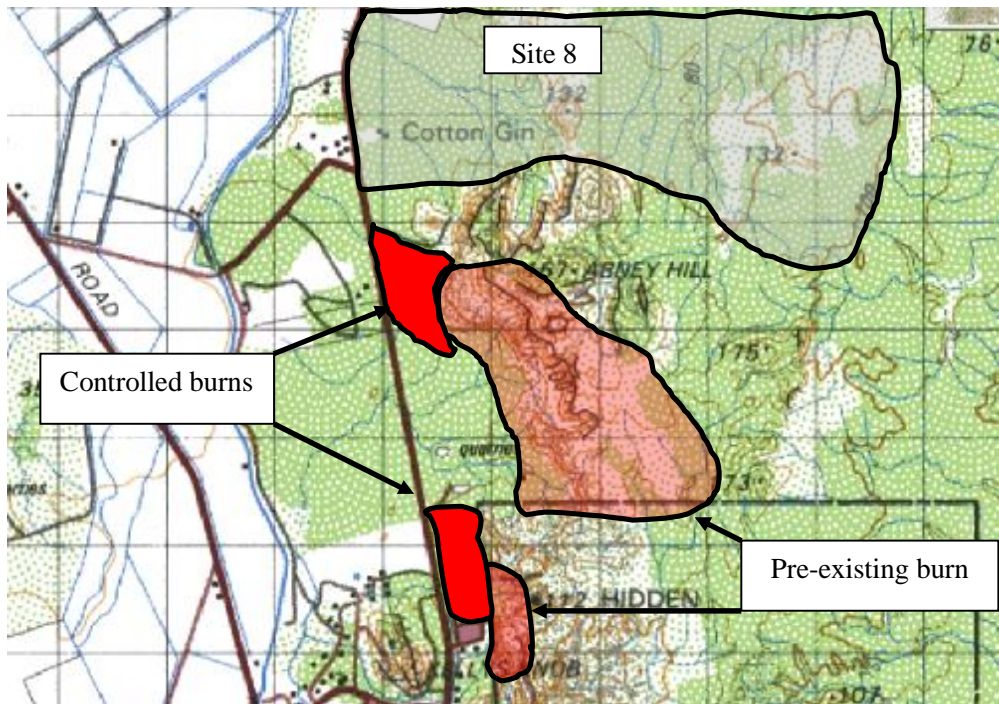
Map 3 from NAFI site.

**2009 Ground:** Based on the identification of priority areas 4,000 hectares of land close to Crossing Falls and Weaber Plain communities to the south-east and north of Kununurra was selected for a controlled burn. This would be done in conjunction with Volunteer brigades located in the areas.

**Outcome:** On Weaber Plain two burns were carried out for the project by the Ivanhoe Bushfire Brigade (see map 4). Deliberately lit fires by persons unknown were assessed by the Ivanhoe Brigade and it was decided to allow them with some management to slowly burn into pre-existing fire scars from controlled burns carried out in April 2009.

The two burns effectively plugged a gap between Weaber Plain Road and the ranges to the east. This area of land is highly susceptible to deliberately lit fires during the dry season that are carried north into the area to be protected (See Map 4 Site 8) by prevailing winds.

Several burns were carried out within the Crossing Falls/Maxwell Plan area, mainly along roadways as this area in particular has been shown to have a high incidence of fire activity in the past see map 5). The work was successfully carried out by the Crossing Fall Brigade over a four week period in May -June 2009 covering 18.2 kilometres of roadway and fire break.



Map 4: Weber Plain burning program.



Map 5: Crossing Falls burning program.

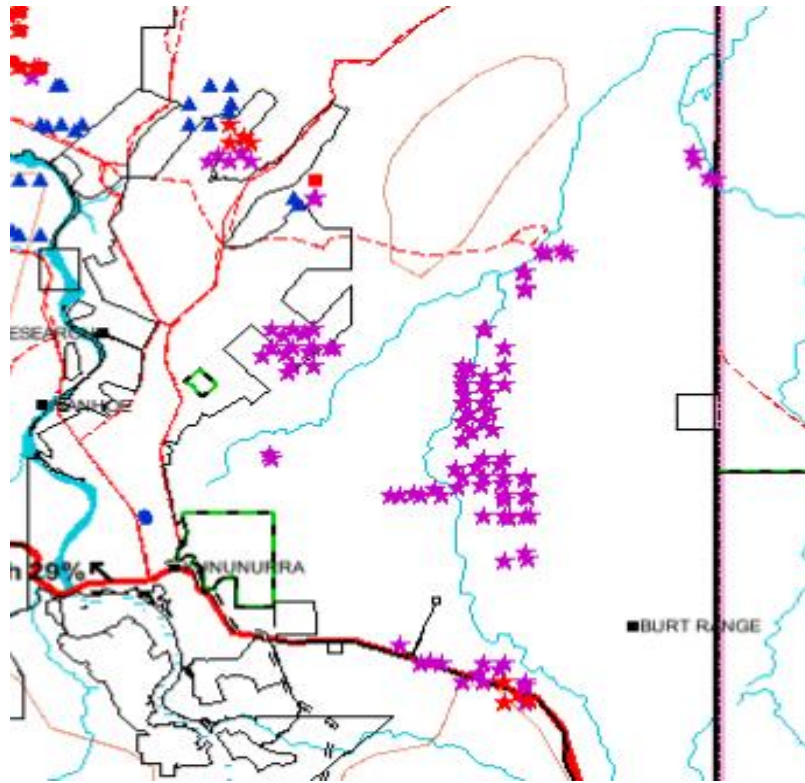
**2010 Aerial:** To be carried out in the same 55,000 hectares of land on the Knox Creek Plain east of Kununurra as the 2009 program. This would be done in conjunction with FESA, Carlton Hill Station, DEC and the Keep River National Park's early season burning programs.

**Outcome:** The inter-organisational burning program covered 9,000,000 hectares of land and was carried out over an approximate two week period from 1<sup>st</sup> to the 15<sup>th</sup> May. The program was considered to be highly successful by all organisations with targets of a 20 to 40% mosaic attained. Further burning was abruptly curtailed by rain a number of significant rain events lasting up until the 30<sup>th</sup> May. In that time Kununurra Airport received 72mm of rain.

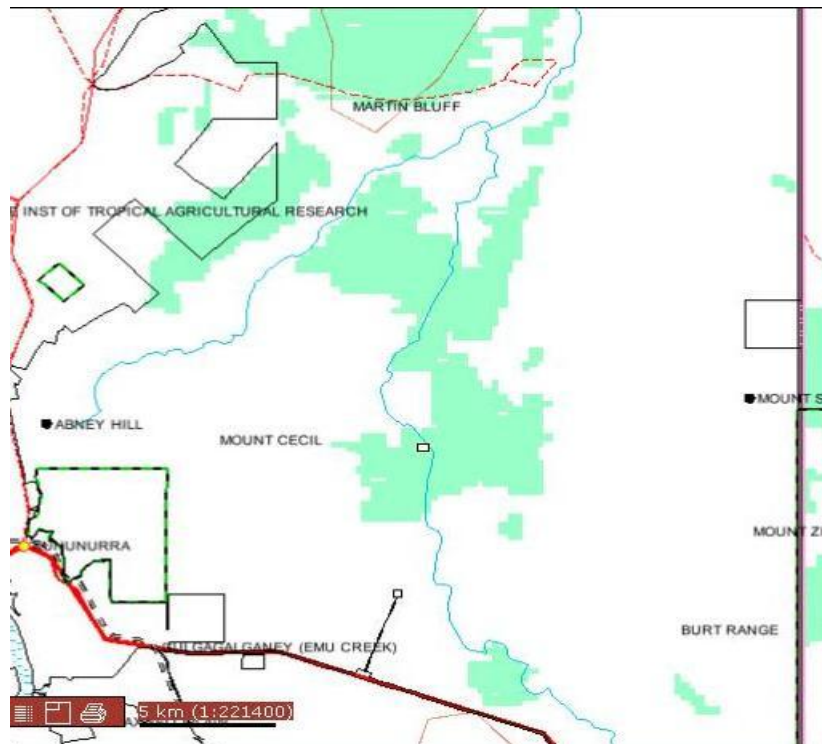
In terms of the OLV burn Map 6 shows the flight path taken. As with 2009 an area close to the Kununurra townsite bordered by the Carlton Hill Knox Creek fenceline did not burn effectively. However as seen in Map 7 showing hotspots and Map 8 showing fire scars the burn was significantly better than 2009. It should be noted that not all the hot spots showing translate to fire scars through remote sensing if they are less than 250 metres in width, hence some of the work against fencelines and roadways as seen in the hot spots does not show in the fire scars.



Map 6 showing flight path



Map 7 Hot spots from Knox Creek burn 8<sup>th</sup> May



Map 8 Fire scars from Knox Creek burn 8<sup>th</sup> May

**2010 Ground:** To be carried out on the same 4,000 hectares of land close to Crossing Falls and Weaber Plain communities to the south-east and north of Kununurra as was selected for the 2009 controlled burn. This would be done once again in conjunction with Volunteer brigades located in the areas.

**Outcome:** This part of the program was delayed significantly by late season rains in April and May. Crossing Falls Volunteer Brigade started their program on the 14<sup>th</sup> June with Ivanhoe Brigade to follow on the 21<sup>st</sup> June.

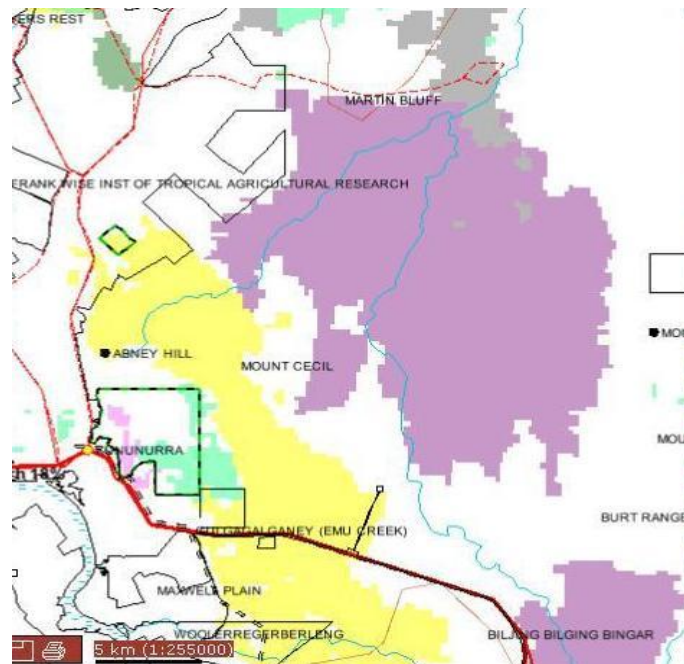
## Demonstration site

**Background:** It had been demonstrated in 2009 that vegetation to the immediate east of Kununurra was not conducive to early burning programs due to soil moisture and uneven grass curing. This placed the following environmental assets in danger of being impacted on by late season fires.

- ✚ Reserve: Mirima National Park 2,063 ha.
- ✚ Rocky Outcrop: Site 8 Mirima north 1,021 ha.
- ✚ Rocky outcrop: Site 9 Lost City 185 ha.
- ✚ Shrubby site: Site 4 Kununurra 243 ha.

Map 3 shows a late season fire that started from a lightning strike in November of 2009. This fire as well as one in August of 2008 (see map 9 yellow scar) impacted significantly on the above sites as well as rural infrastructure.

With the installation of the fenceline in mid 2008 it created an opportunity to provide a point to work from in terms of early control strategies and suppression activities when wildfires approached.



Map 9 showing 2008 fire scars on Knox Creek

Unfortunately there were problems with maintaining the fenceline firebreak in 2009; cane grass was able to grow to about three to four metres high along the fenceline. Wet season inundation of the area prevents any sort of ground based chemical control and the nature of the soil makes it highly susceptible to erosion when heavy equipment such as graders are used in a maintenance role.



Fenceline June 09 showing lack of maintenance

In January 2010 a demonstrations site was developed along 30 kilometres of the fenceline to trial an aerial application of herbicide. This would have two expected benefits –

- ✚ Timely removal of vegetation from the fenceline
- ✚ No erosion stemming from the use of heavy equipment to maintain the fence line.



Fenceline spraying January 2010

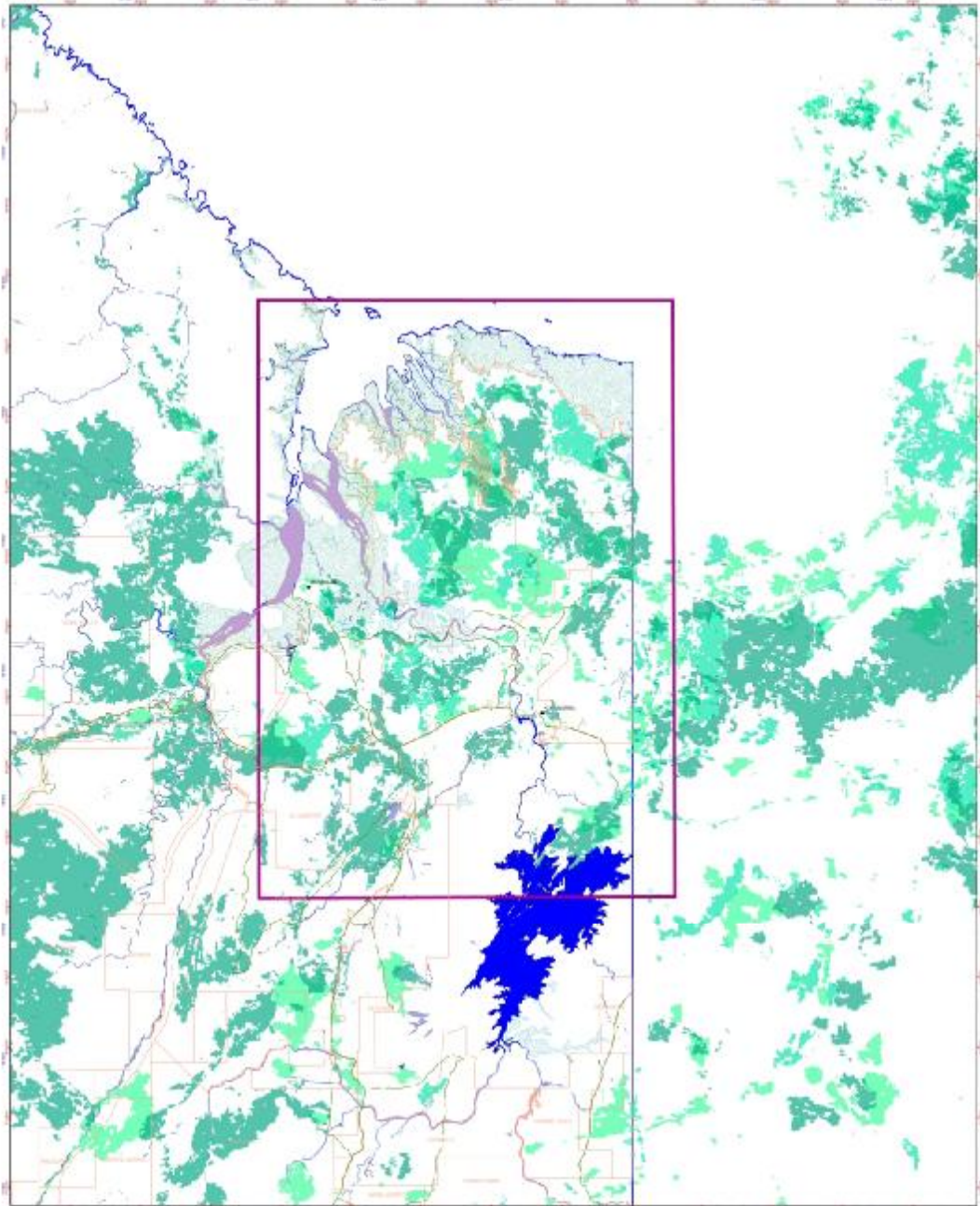


Fenceline firebreak completed February 2010

**Outcomes:** The trial proved to highly successful with cane grass removed from the fenceline 10 to 12 metres either side of the fence. Glyphosate at three litres/ hectare and Fluroxypyr at 300mls/hectare was applied, this removed the grasses but did not disturb the various sedges growing in the drainage lines ensuring any potential for erosion from the work was minimised. At accost of \$60/kilometre it demonstrated itself to be competitive option to carrying out the same job with a grader during the dry season and as a consequence reduced the amount of erosion attributable to grader operations.

# Appendix 1

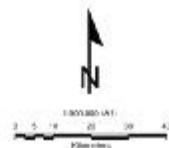
## East Kimberley Fire Project - Early firescars



Source: DORA 2010, in the context of the OLV study area.

### Legend

- WA Townships
  - WA Coast
  - Major sealed roads
  - Unsealed roads
  - Pastoral leases - ALL (shaded)
  - OLV Study Area
- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>■ Kimberley Waterholes</li> <li>■ Lake</li> <li>■ Mangrove Flat</li> <li>■ RIVERVIEW</li> <li>■ Salina Coastal Flat</li> <li>■ Subject to knowledge</li> <li>■ Swamp</li> <li>■ WARRINGEE</li> </ul> | <ul style="list-style-type: none"> <li>■ 2008 Jan-Jun Fire scars</li> <li>■ 2007 Jan-Jun Fire scars</li> <li>■ 2006 Jan-Jun Fire scars</li> <li>■ 2004 Jan-Jun Fire scars</li> <li>■ 2009 Jan-Jun Fire scars</li> </ul> |
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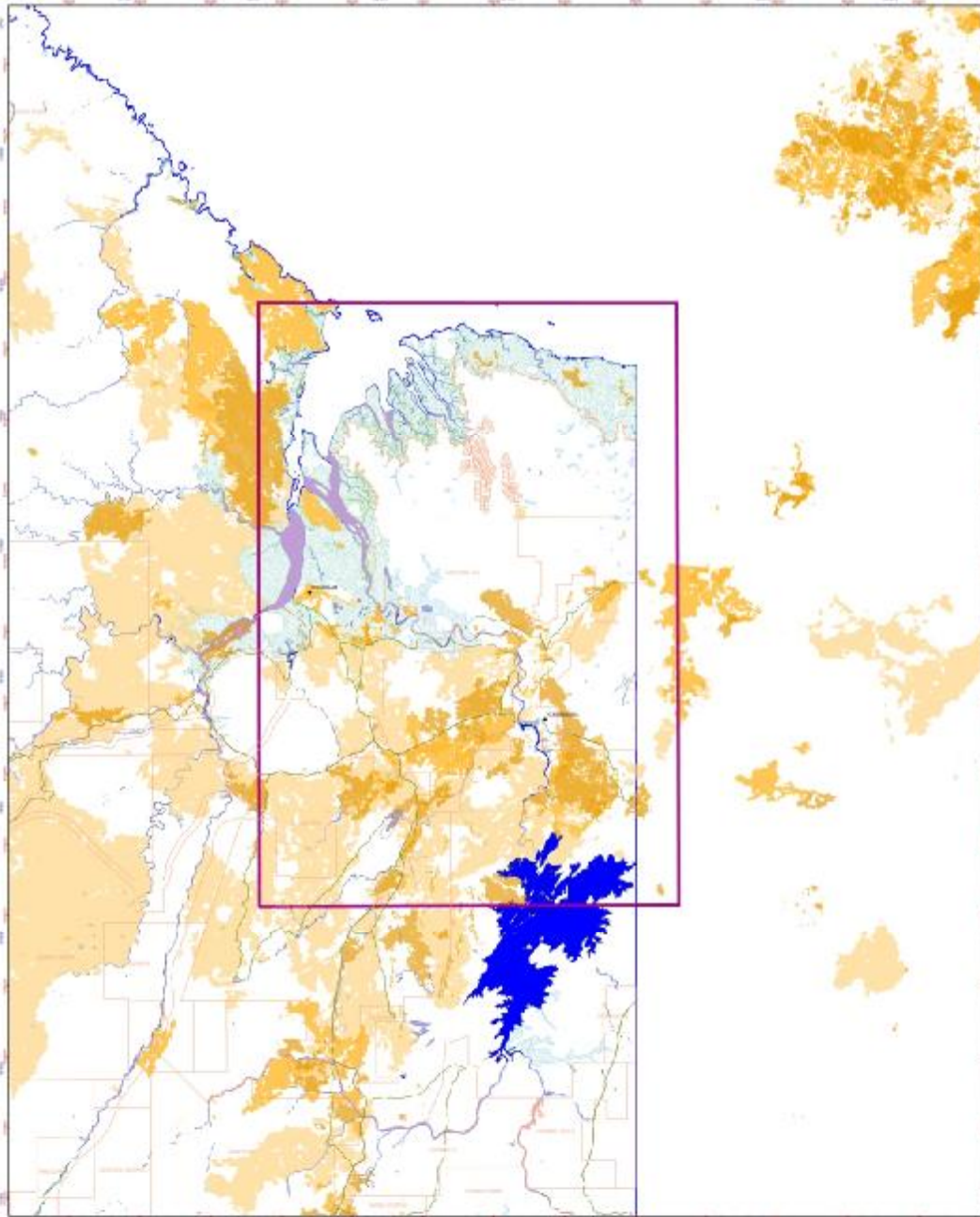


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Peter Williams  
Shirley Mitchell, Department of  
Environmental Conservation

Produced in 2010 on February 6, 2010

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# East Kimberley Fire Project - Midyear Fire scars 2006-08



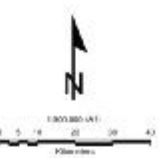
ESRI/ARC/INFO 2008 or later theme  
 ArcSDE 9.3.1/9.3.1/9.3.1/9.3.1

**Legend**

- WA Townships
- WA Coast
- Major sealed roads
- Unsealed roads
- Pastoral Leases - ALL (statewide)
- CLW Study Area

- KIMBERLEY Waterbodies**
- Lake
  - Mangrove Flit
  - Reservoir
  - Saline Coastal Flat
  - Subject to inundation
  - Swamp
  - Wetlands zone

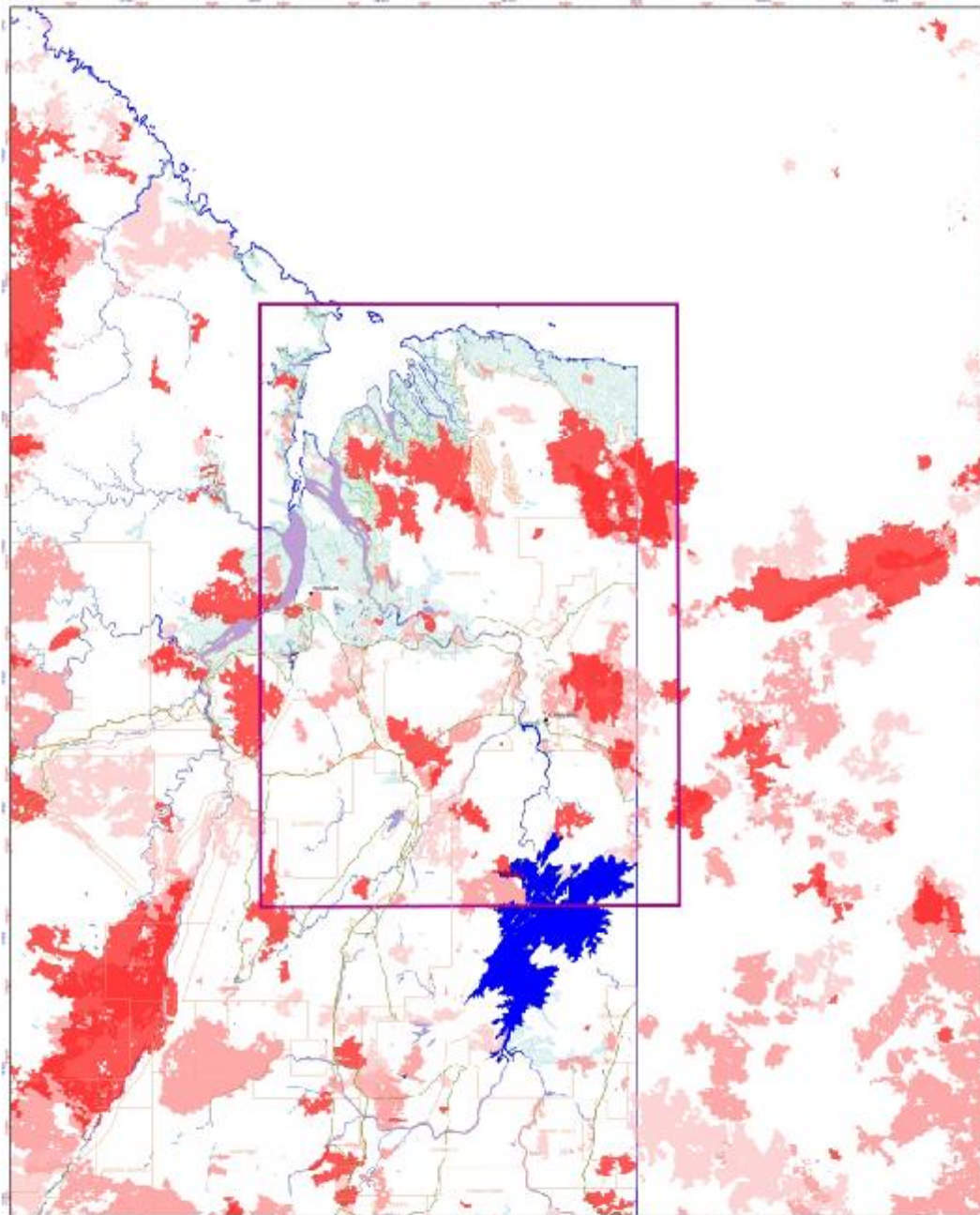
- 2008 Jul-Sept Fire scars July - Sept
- 2007 Jul-Sept Fire scars July - Sept 2007
- 2006 Jul-Sept Fire scars July - Sept 2006



Prepared under the Director of State Information  
 Kimberley Group, Department of  
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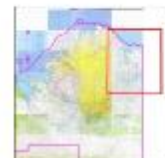
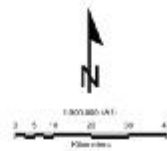
## East Kimberley Fire Project - Late Firescars 2006-08



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 2008

### Legend

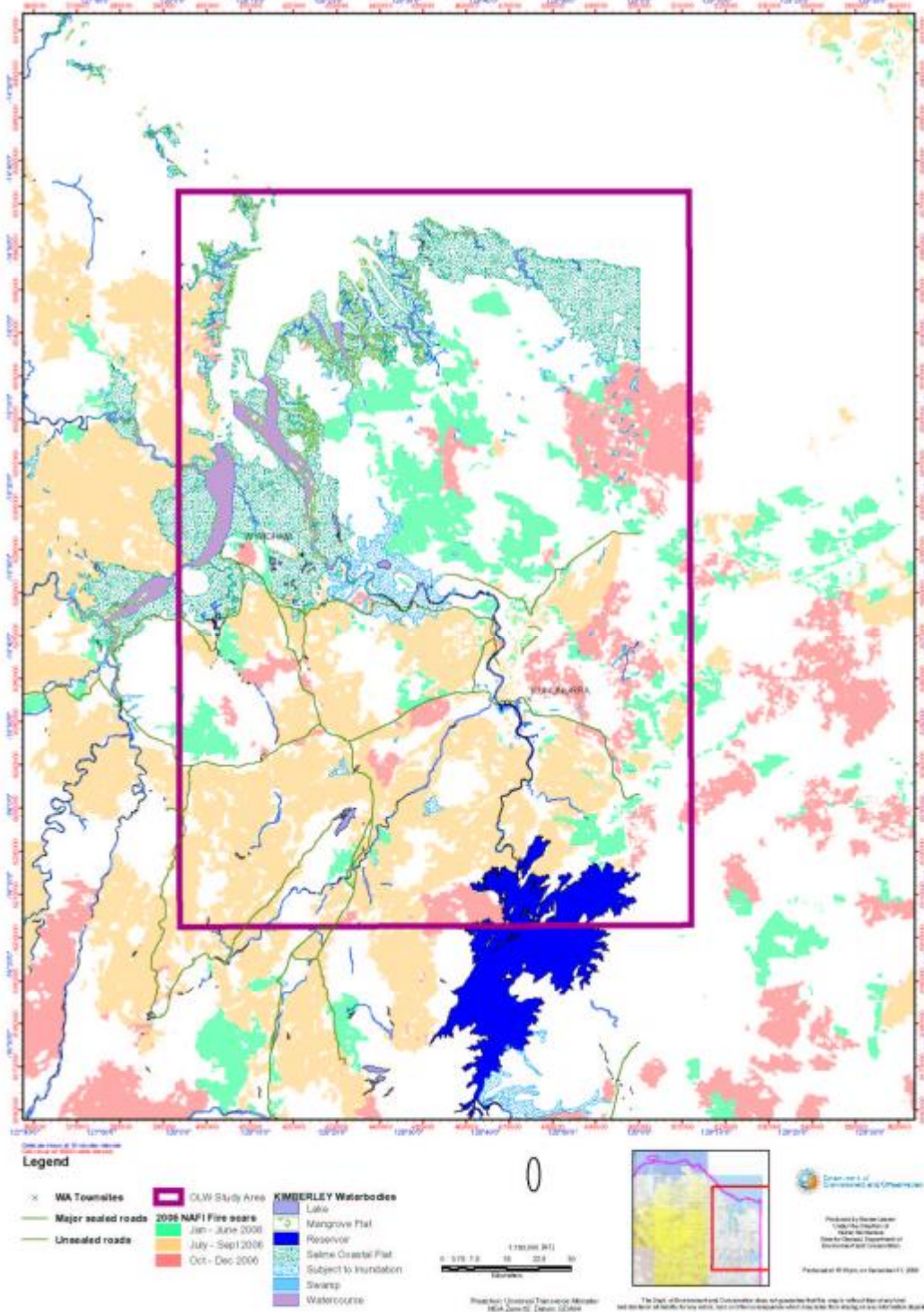
- WA Towns
  - WA Coast
  - Major sealed roads
  - Unsealed roads
  - Pastoral Leases – ALL (statewide)
  - ULM Study Area
- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>— KIMBERLEY Waterbodies</li> <li>— LFO</li> <li>— Mangrove Rip</li> <li>— Reservoir</li> <li>— Saltwater Coastal Wet</li> <li>— Subject to Irrigation</li> <li>— Swamp</li> <li>— Watercourse</li> </ul> | <ul style="list-style-type: none"> <li>■ 2006 Oct-Dec Fire scars<br/>GE - Dec</li> <li>■ 2007 Oct-Dec Fire scars<br/>GE - Dec 2007</li> <li>■ 2008 Oct-Dec Fire scars<br/>GE - Dec 2008</li> </ul> |
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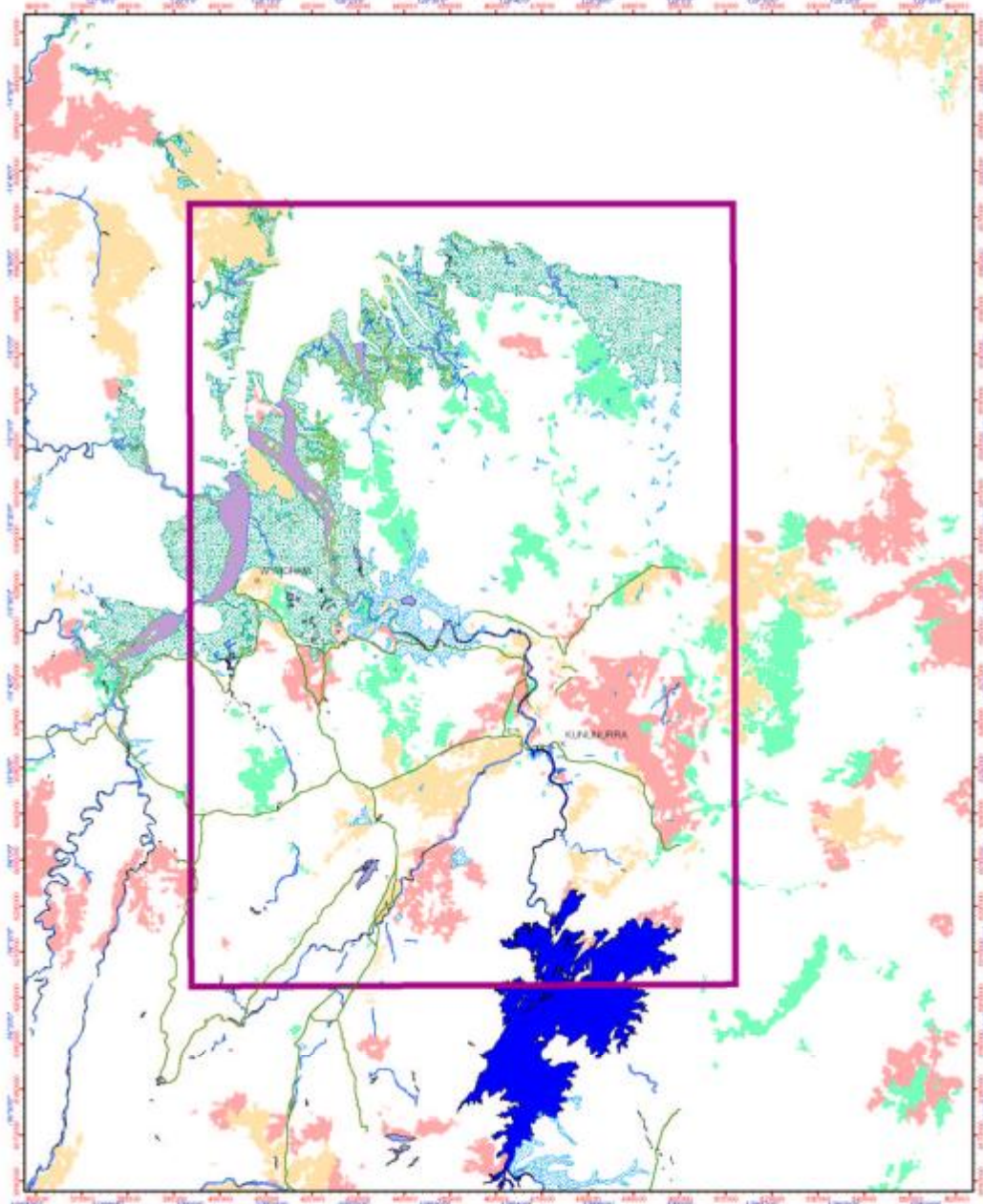
Prepared by: Simon Lavery  
 Project Officer  
 Peter Williams  
 Project Officer  
 Produced: 03/02/08 on February 6, 2008

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# East Kimberley Fire project - 2006 Firescars



# East Kimberley Fire project - 2007 Firescars



**Legend**

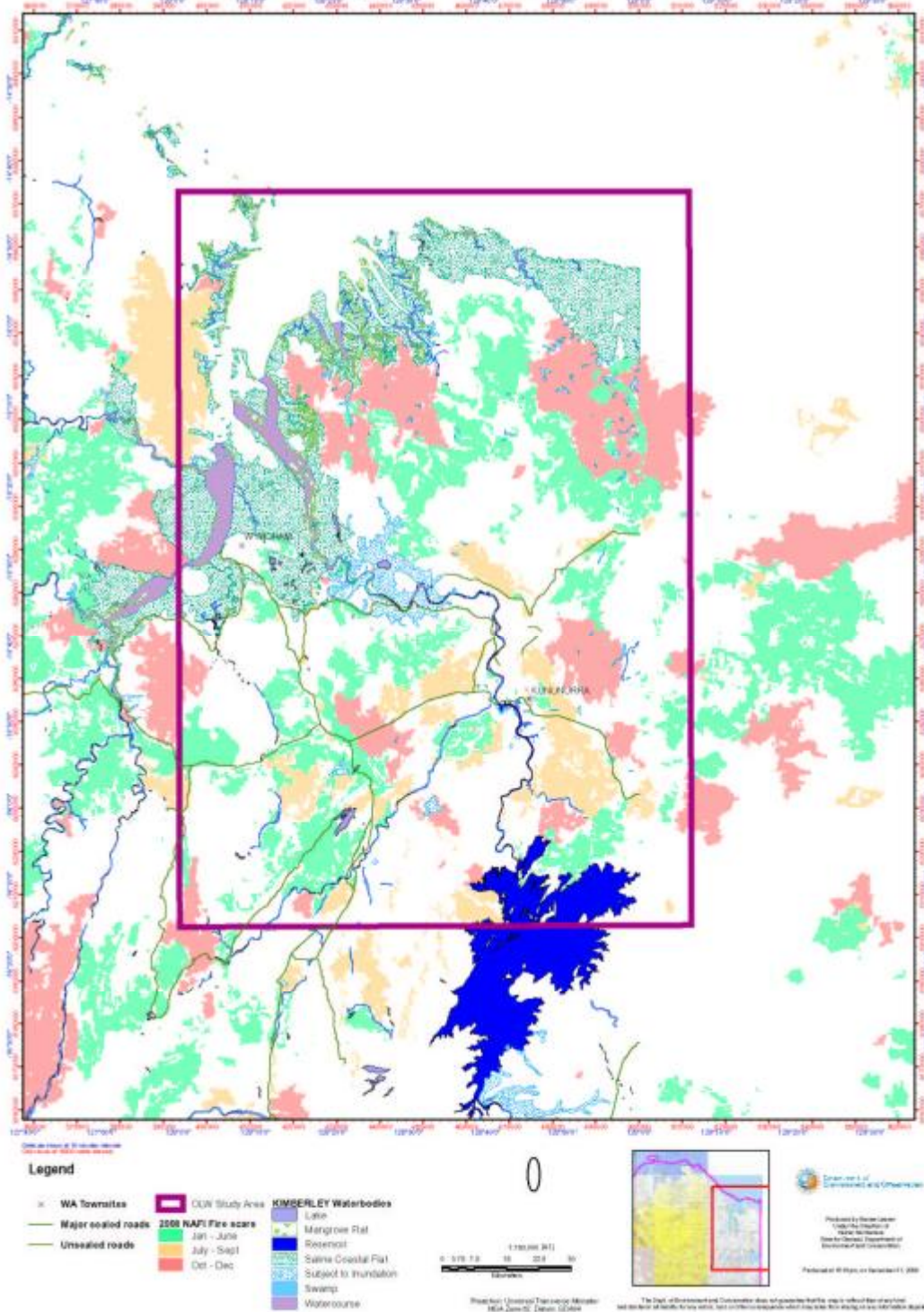
<ul style="list-style-type: none"> <li>⊙ Wk Townsites</li> <li>— Major sealed roads</li> <li>— Unsealed roads</li> <li>▭ OLV Study Area</li> </ul>	<p><b>KIMBERLEY Waterbodies</b></p> <ul style="list-style-type: none"> <li>■ Lake</li> <li>■ Mangrove Flat</li> <li>■ Saltmarsh</li> <li>■ Saline Coastal Flat</li> <li>■ Subject to inundation</li> <li>■ Swamp</li> <li>■ Wetlands</li> </ul>	<p><b>2007 MAFI Fire scars</b></p> <ul style="list-style-type: none"> <li>■ Jan - Jun 2007</li> <li>■ Jul - Sep 2007</li> <li>■ Oct - Dec 2007</li> </ul>
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 Government of Western Australia  
 Produced by Sheree Latham  
 Project and Production of  
 "2007 MAFI Fire Scars"  
 State of Western Australia  
 Department of Environment and Conservation  
 Perth-based 90 days on 26 November 2008

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 MSA, June 02, © Jason G. Cohen  
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# East Kimberley Fire Project - 2008 Fire scars



## Appendix 2

### Areas of environmental value Identified for the fire project

One meeting and a number of 'one on one' interviews were held in March 2009 with community members. Participants were asked to identify on a map areas they considered to be of environmental significance and prioritise the area with a rating of either high or medium priority.

#### Rated high priority

**Existing Reserves and National Parks** (note the reserves were pre-identified as priorities prior to the consultation process)

- ✚ Reserve Livistona 70,828 ha.
- ✚ Reserve Mirima National Park 2,063 ha.
- ✚ Reserve Packsaddle Wetland 895 ha.
- ✚ Reserve Ningbing 21,749 ha.
- ✚ Reserve Septimus 14,317 ha.
- ✚ Reserve Pincombe Range 17,898 ha
- ✚ Reserve Weaber Range 29,149 ha

#### Wetlands and mound springs

- ✚ Site 1 Fishfarm Road 219 ha.
- ✚ Site 13 Boab Spring.
- ✚ Site 14 Snake Spring.
- ✚ Site 15 Bamboo Spring.
- ✚ Site 16 King Gordon Spring.
- ✚ Site 17 Bull Spring.
- ✚ Site 18 Gladys's Spring.
- ✚ Site 19 Leichardt Spring.

#### Rain forest and closed forests

- ✚ Site 5 Stonewall Creek 462 ha.

#### Riparian Areas

- ✚ Site 6 Lake Kununurra 609 ha.
- ✚ Site 7 Packsaddle Creek 367 ha (note area situated within Site 11).

#### Typhnium gazetted rare flora site

#### Areas of Callitris outside existing reserves

- ✚ Site 10 Ningbing east 1192 ha (note sites are within this area).
- ✚ Site 12 Carlton north 5528 ha (note sites are within this area).

#### Rated medium priority

**Ranges and 500m buffer of saturated soils.**

- Site 11 Carr Boyd Ranges 121,268ha.

**Rocky outcrops harbouring obligate seeders**

- Site 2 Maxwell Plain 520 ha.
- Site 8 Mirima north 1,021 ha.
- Site 9 Lost City 185 ha.

**Shrubby sites,**

- Site 4 Kununurra 243 ha.

**Fire protected areas**

- Site 3 Matheson Ridge 1481 ha.



