Fire management 2024-25
Frankland District
Stakeholder presentation
Walpole 11 June 2025

DBCA acknowledges all Aboriginal people as the Traditional Owners of the land and waters it manages throughout Western Australia. We pay our respects to them, their culture and to their Elders past and present.

DBCA values its staff, the community, visitors and stakeholders and provides collaborative delivery of services based on integrity, accountability and diversity.

GOVERNMENT OF WESTERN AUSTRALIA

Department of **Biodiversity, Conservation and Attractions**

PARKS AND WILDLIFE SERVICE

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Welcome

Fire Management Program Meeting

Agenda

- Welcome and DBCA Responsibility
- 2024-25 Season Review
- Bushfire Summary 2024-25
- Burn Options Program 2025-26
- Detection and Aerial Suppression
- Managing Biodiversity Values
- Fire Science Projects

Responsibility

- DBCA has a legislated responsibility under the CALM Act 1984 and the Bushfires Act 1954
- For the prevention, management and control of fire on land.
- We (DBCA) live and work as part of the community

Guiding Legislation

Conservation and Land Management Act 1984

33.CEO, functions of

(1) The functions of the CEO are, subject to the direction and control of the Minister —

(a) to manage —

(i) land to which this Act applies; and

(ii) subject to the relevant section 8A agreement, section 8A land; and

(iii) subject to the relevant order made under section 8C, section 8C land, and the associated fauna, flora and forest produce; and

(aa) without limiting paragraph (a), to take any measures that the CEO considers necessary or expedient, including planned burning, on —

(i) land to which this Act applies; and

(ii) subject to the relevant section 8A agreement, section 8A land; and

(iii) subject to the relevant order made under section 8C, section 8C land, for the purpose of preventing, managing or controlling fire on that land; and

(d) to promote, encourage and facilitate the conservation, protection and management of biodiversity and biodiversity components in the State; and

(dab) to promote, facilitate and manage nature-based tourism and recreation, as defined in the *Biodiversity Conservation Act 2016* section 190, in the State in accordance with this Act and the *Biodiversity Conservation Act 2016*; and

(da) to promote and facilitate public recreation, in accordance with this Act, on land to which this Act applies; and

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Guiding Policy

Corporate Policy Statement No. 88 – Prescribed Burning

Fire Management Strategy

Bushfire Risk Management Framework

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Guiding Policy

Regional Fuel Management Plan – Warren Region

Warren Region

- Spans 9 local governments
- DBCA manages 64% of the land (930,307 hectares)
- Consists of National Parks, Nature Reserves, State Forest, Timber reserves, Marine Park and other reserves

Warren Region

Fire Management Strategies

- Use prescribed burning and other fuel mitigation strategies in the rural urban interface to protect towns, settlements subdivisions from the impacts of bushfire.
- Use prescribed burning to maintain a landscape scale mosaic of fuel age and structure which inhibits the spread of bushfires and creates opportunities for successful fire suppression.
- Apply prescribed fire or other fuel modification techniques with consideration to visitor experiences and visitor safety.

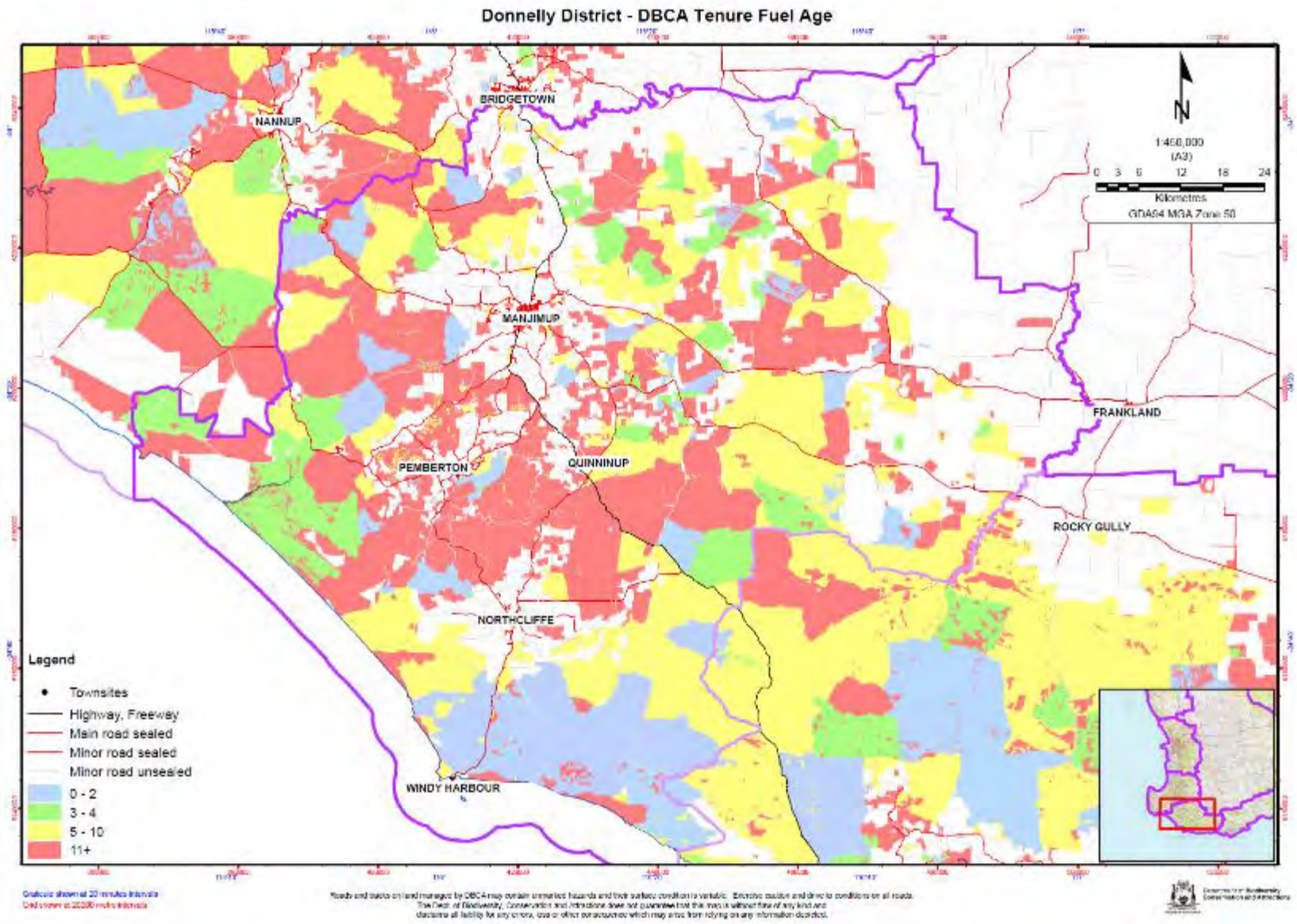
Fire Management Strategies-cont.

- Use prescribed burning to maintain adequate habitat linkages for ecosystem resilience and to support biota.
- Apply prescribed fire to the landscape with due consideration of requirements of important species and communities.
- Undertake a comprehensive assessment of cultural values in collaboration with local communities and implement appropriate bushfire mitigation strategies to ensure the protection and preservation of these values.

Slide 11: Stakeholder presentation – Fire management
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

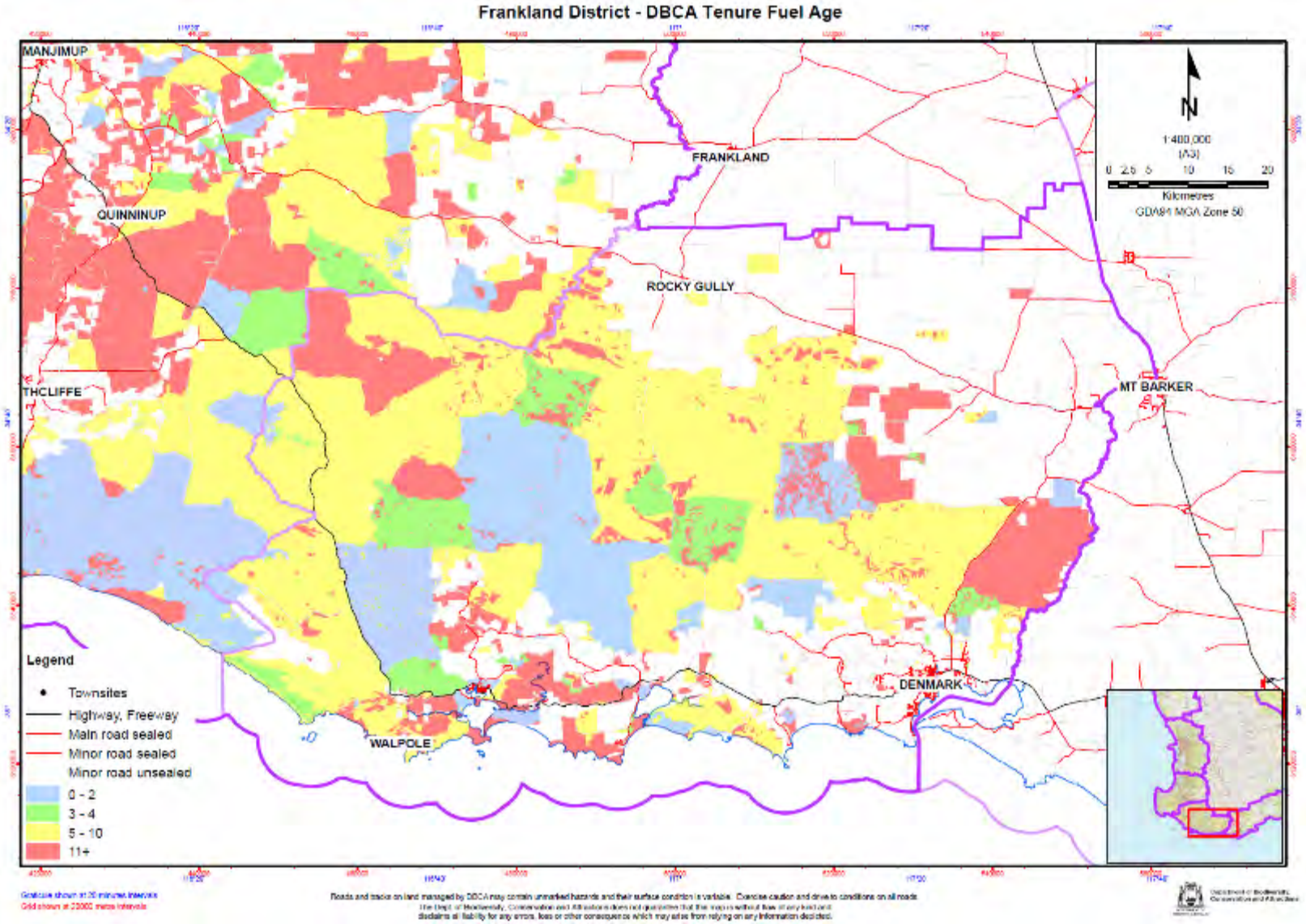
PARKS AND WILDLIFE SERVICE



Slide 12: Stakeholder presentation – Fire management
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE



Slide 13: Stakeholder presentation – Fire management
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Resources for management – Warren Region

- 180 employees (~ 160 actively involved in fire management)
- 23 x fire trucks (including high lift pumper)
- 2 x fire spotter aircraft (based Manjimup)
- 1 x fire tower – Mt Frankland
- Plant
  - 3 Bulldozers
  - 2 Front end loaders
  - 3 Prime movers + floats
  - 3 Skidsteers
  - Can-am side-by-side x 4
- Fixed wing water bombers (DFES/DBCA)
  - 2 x Albany
  - 2 x Manjimup

Department of Biodiversity, Conservation and Attractions

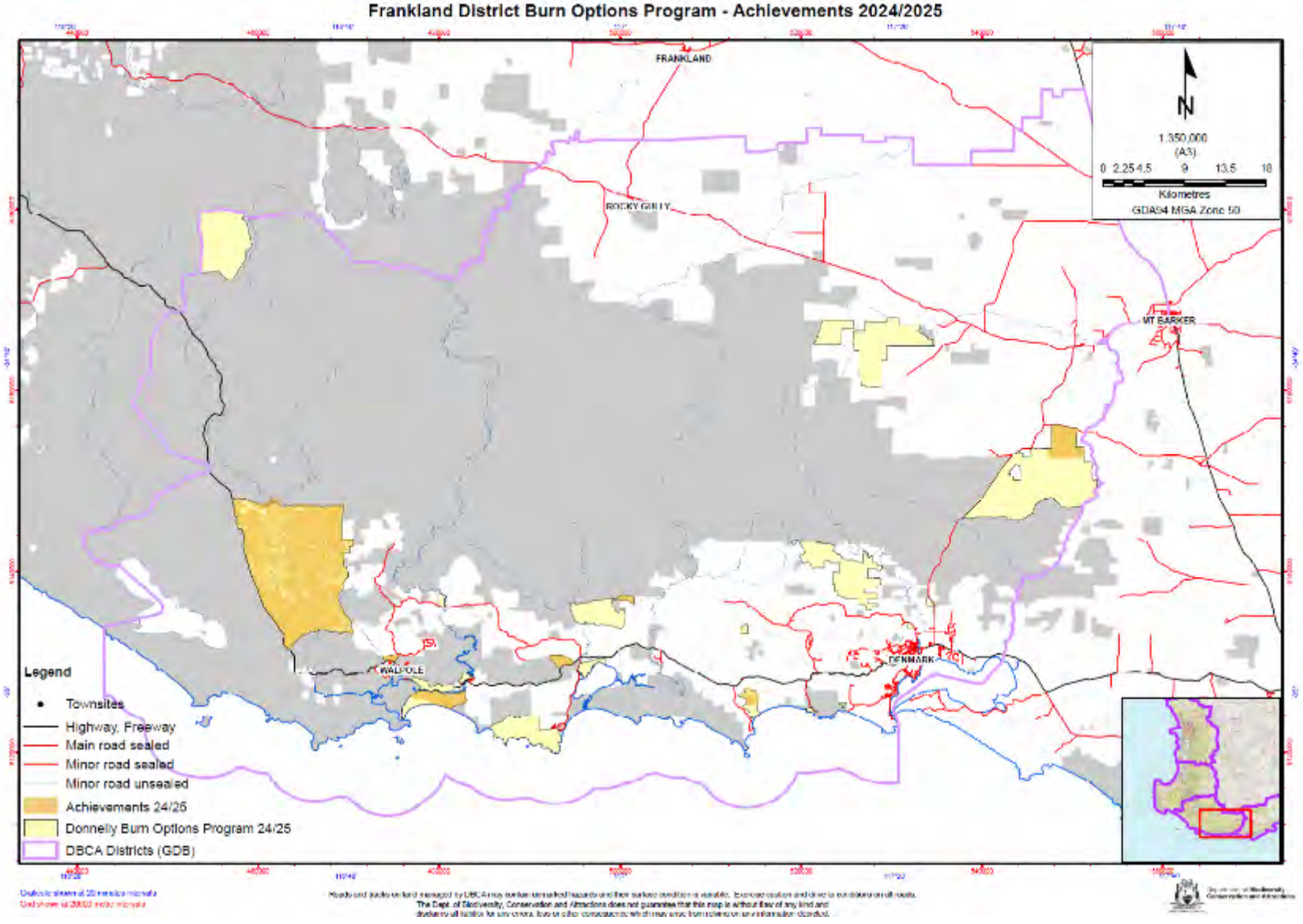
PARKS AND WILDLIFE SERVICE

Prescribed Burning 2024-25
Frankland District

Slide 16: Stakeholder presentation – Prescribed burning
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

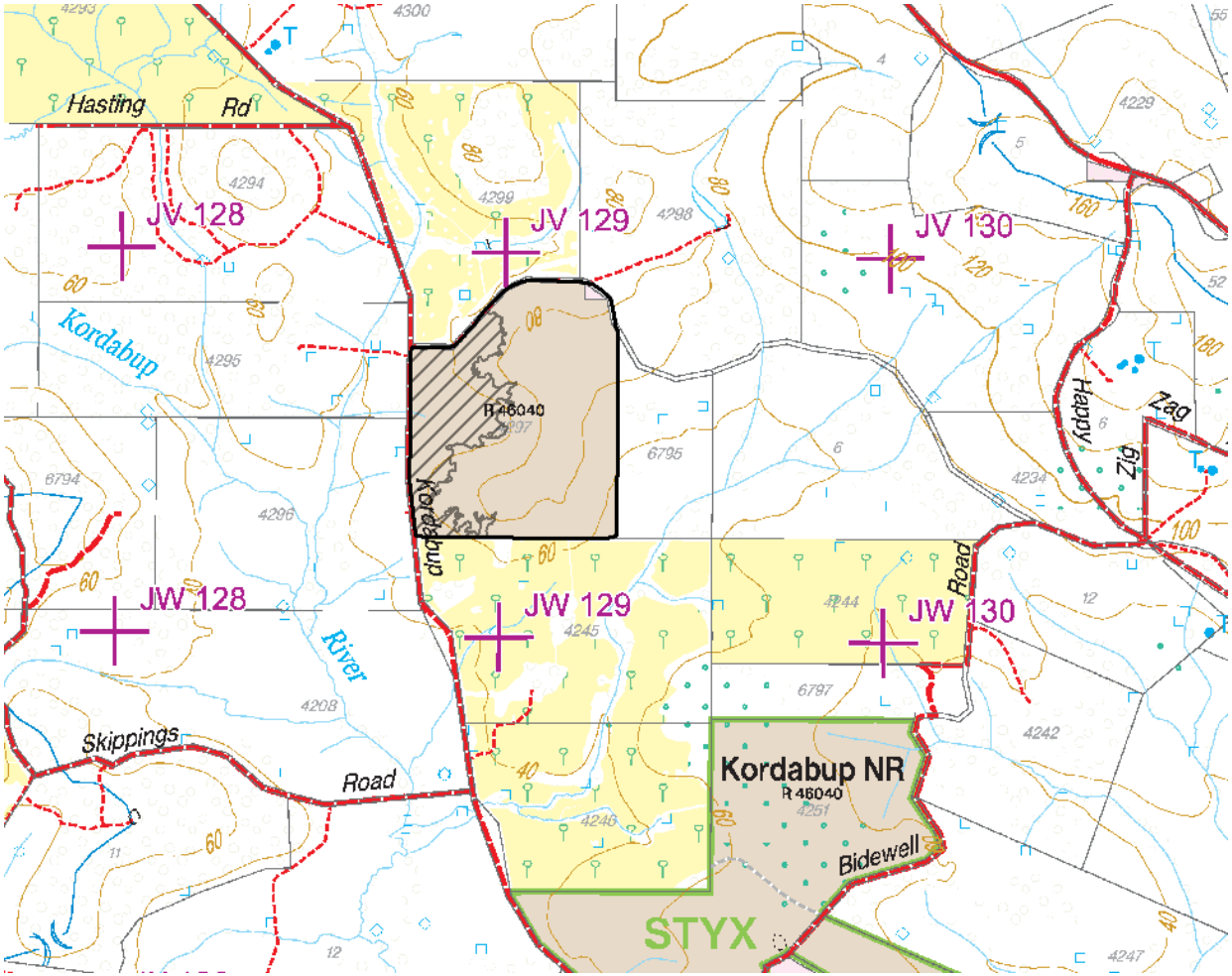
PARKS AND WILDLIFE SERVICE

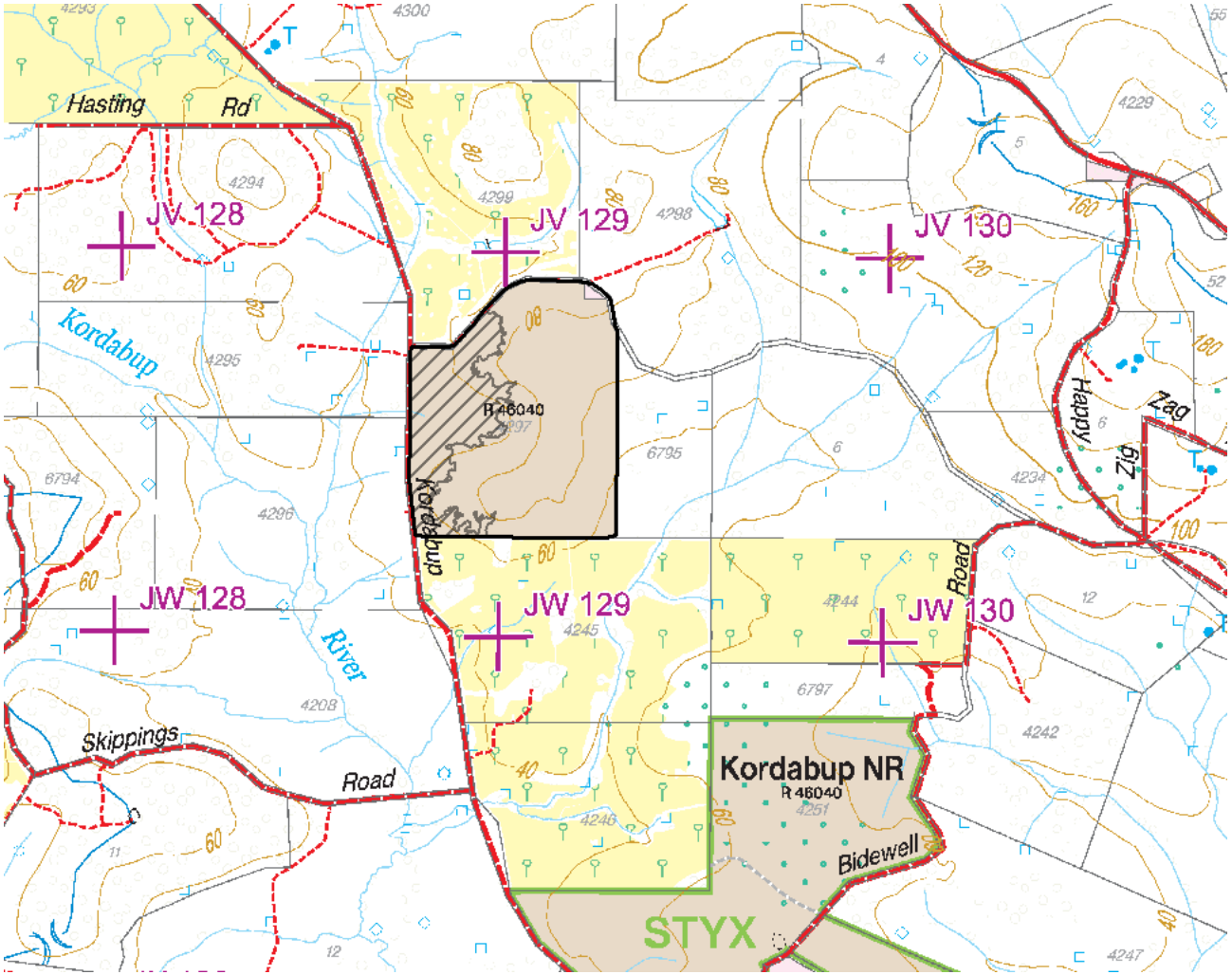


Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

FRK_105 Kordabup NR



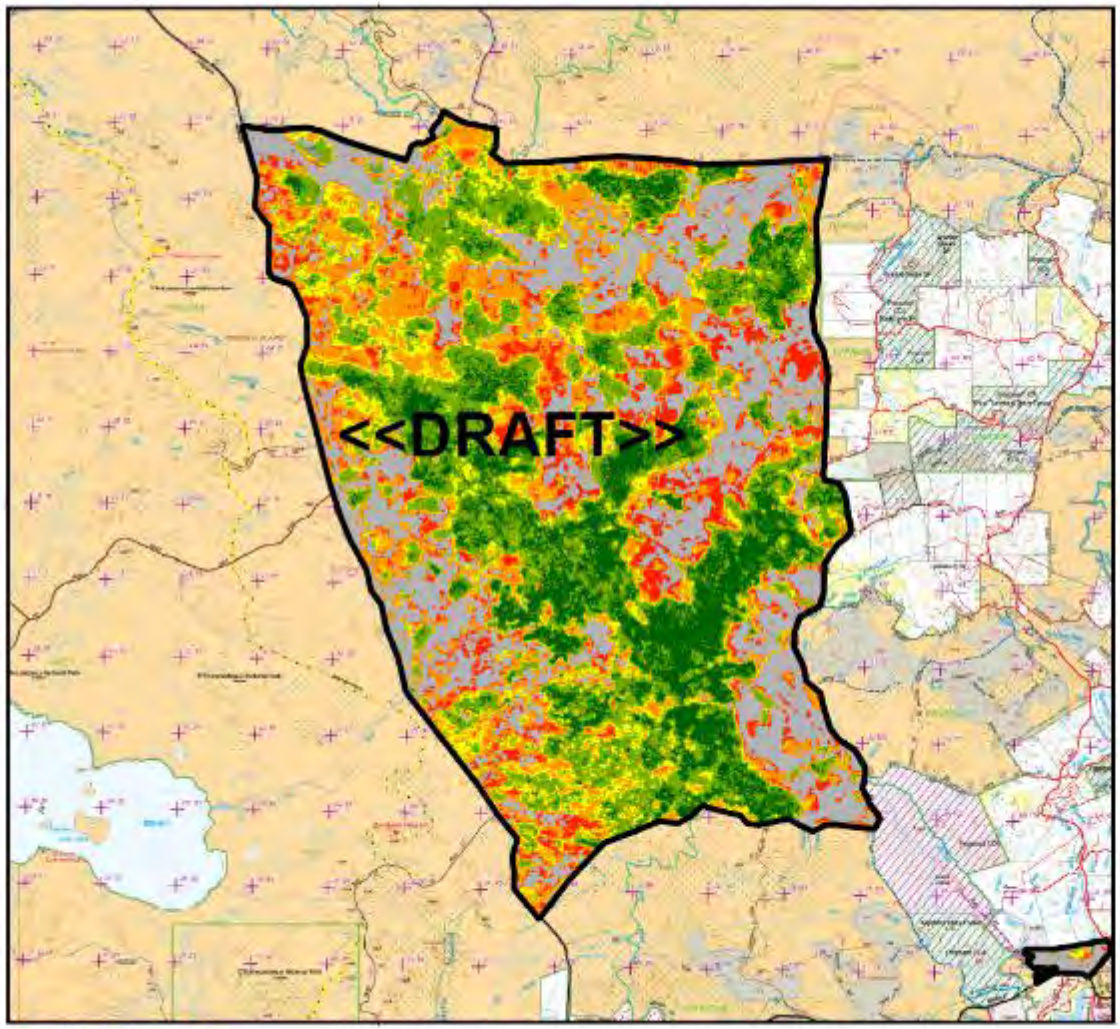


FRK_107 Ordnance

Slide 19: Stakeholder presentation – Prescribed burning Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE



Indicative Burn Severity Map

Ordnance

Burn Id: FRK107

Date created: 27/02/2025

Latest satellite image: 2/01/2025

Legend

Treatment area	
Unburnt:	14.06 %
Low:	25.15 %
Medium:	10.77 %
High:	18.81 %
Very high:	7.69 %
Burnt heath:	23.52 %
Total area:	14704 ha

0 0.75 1.5 3 4.5 6
Kilometres

GDA2020 MGA Zone 50 1:115,000 (A4)

N

Produced by the Department of Biodiversity, Conservation and Attractions

Graticule shown at 1 degree intervals
Grid shown at 100000 metre intervals

Produced at 11:30am, on June 24, 2024

Densmore VS, van Dongen RJ, Ong R, Harris BG, 2022, OzCBI: the composite burn index adapted to assess fire severity and key fauna habitat features in Australian ecosystems, Australian Forestry, 86:1-21

Slide 20: Stakeholder presentation – Prescribed burning
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Slide 21: Stakeholder presentation – Prescribed burning
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Slide 22: Stakeholder presentation – Prescribed burning
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Slide 23: Stakeholder presentation – Prescribed burning
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Slide 24: Stakeholder presentation – Prescribed burning
Walpole 11 June 2025

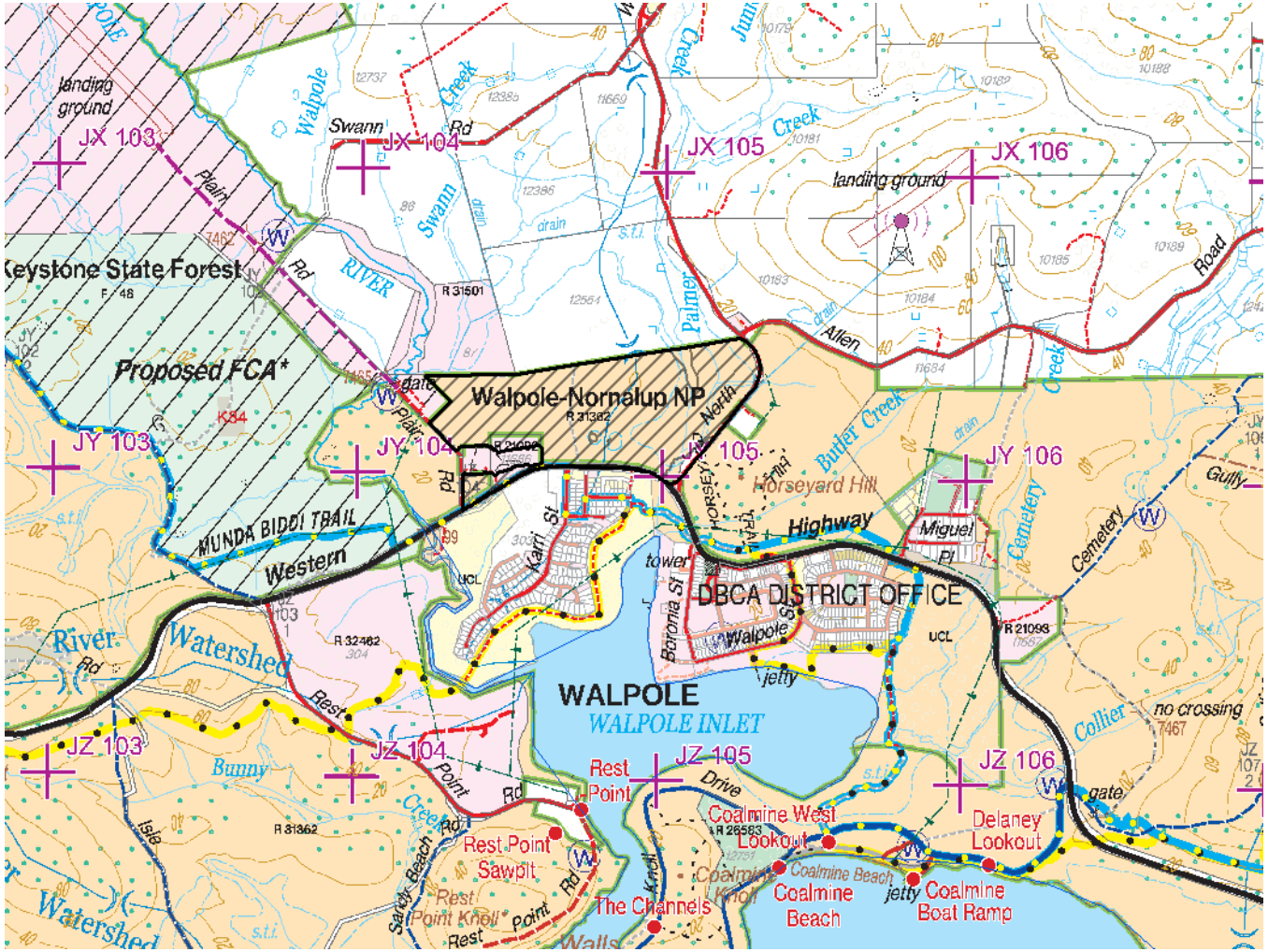
Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Department of Biodiversity, Conservation and Attractions

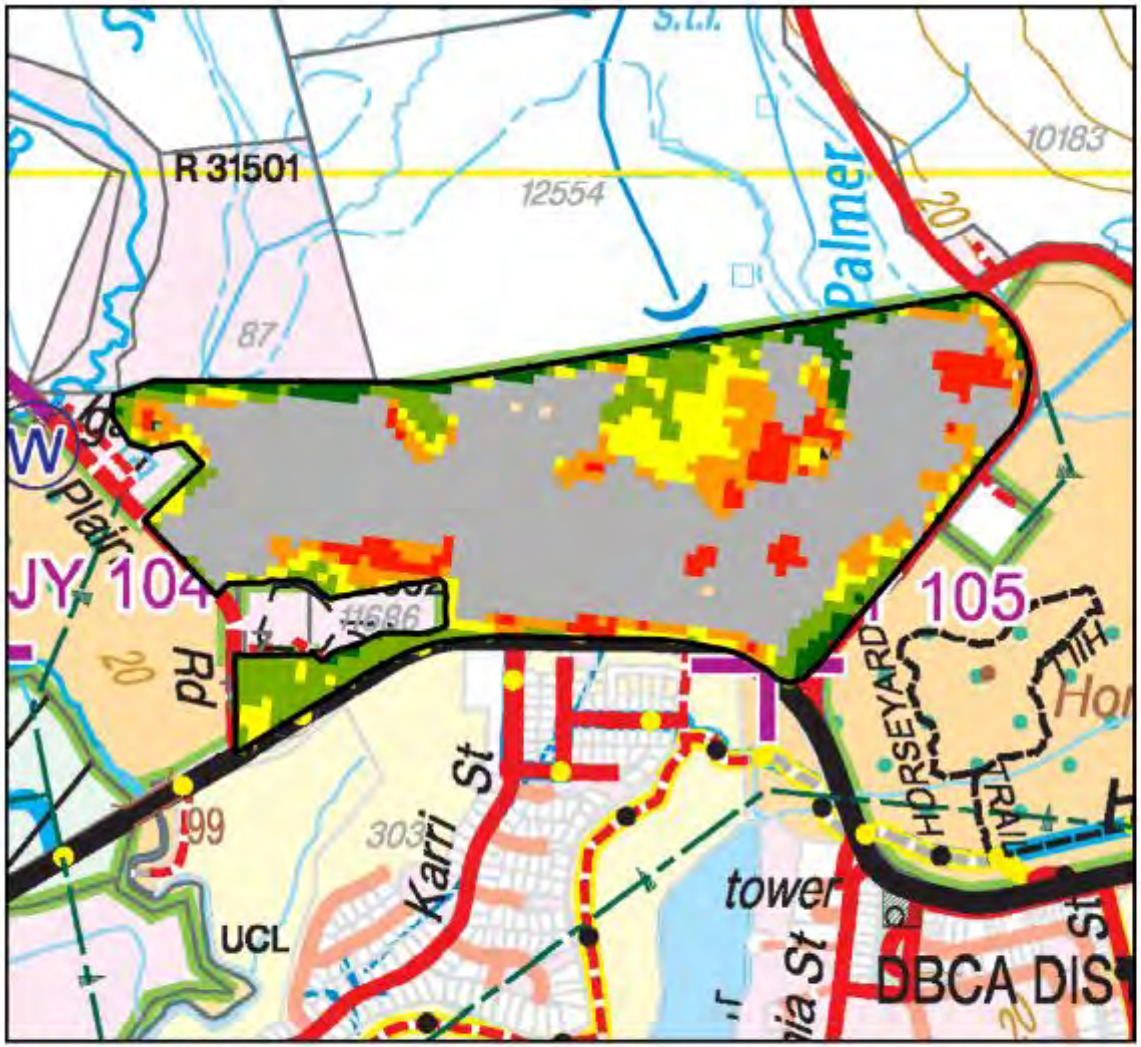
PARKS AND WILDLIFE SERVICE

FRK_109 Plain Road



Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE



Indicative Burn Severity Map

Plain Road

Burn Id: FRK109

Date created: 27/02/2025

Latest satellite image: 18/11/2024

Legend

Treatment area

Unburnt:	4.74 %
Low:	11.42 %
Medium:	9.75 %
High:	10.02 %
Very high:	5.51 %
Burnt heath:	58.57 %
Total area:	89 ha

0 0.075 0.15 0.3 0.45 0.6
Kilometres

GDA2020 MGA Zone 50

1:11,000 (A4)

N

Produced by the Department of Biodiversity, Conservation and Attractions

Graticule shown at 1 degree intervals
Grid shown at 100000 metre intervals

Produced at 11:30am, on June 24, 2024

Jensmore VS, van Dongen RJ, Ong R, Harris BG, 2022, OzCBI: the composite burn index adapted to assess fire severity and key fauna habitat features in Australian ecosystems, Australian Forestry, 86:1-21

Slide 27: Stakeholder presentation – Prescribed burning
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Slide 28: Stakeholder presentation – Prescribed burning
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Slide 29: Stakeholder presentation – Prescribed burning
Walpole 11 June 2025

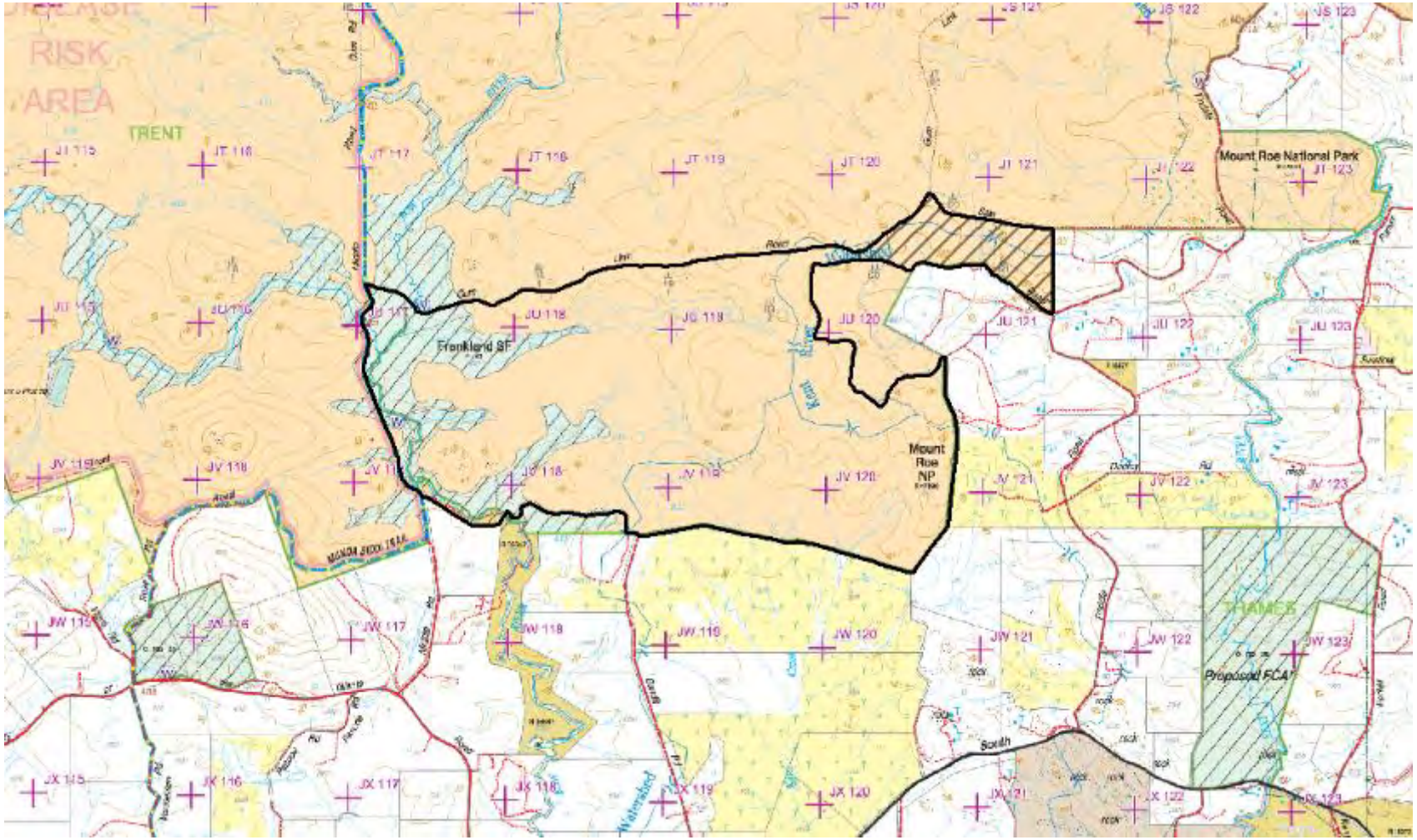
Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

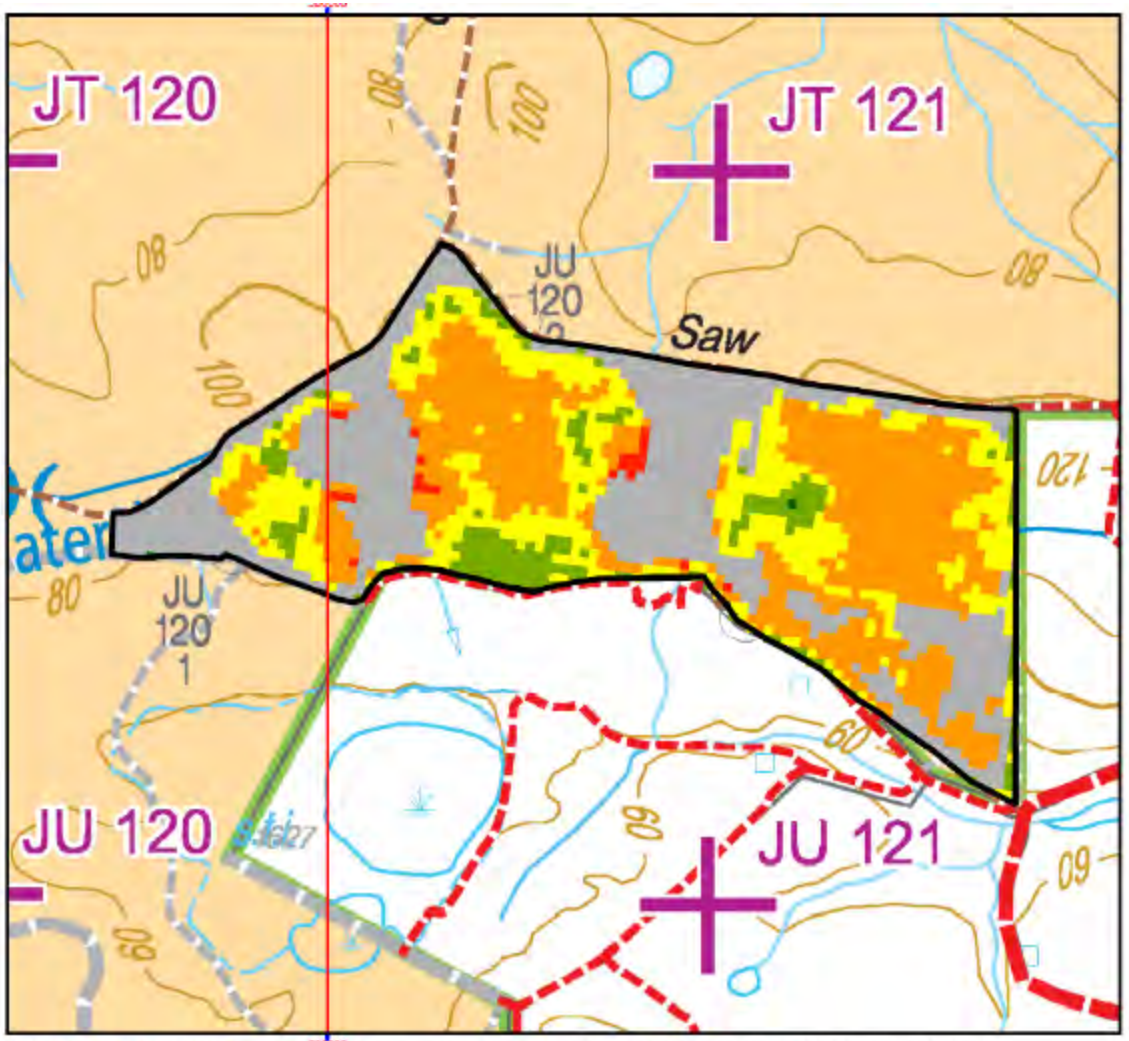
FRK_110 Thames South



Slide 31: Stakeholder presentation – Prescribed burning
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE



Indicative Burn Severity Map

Thames South

Burn Id: FRK110

Date created: 27/02/2025

Latest satellite image: 28/11/2024

Legend

Treatment area

Unburnt:	0.08 %
Low:	7.82 %
Medium:	22.2 %
High:	34.1 %
Very high:	0.95 %
Burnt heath:	34.86 %

Total area: 105 ha

0 0.075 0.15 0.3 0.45 0.6
Kilometres

GDA2020 MGA Zone 50 1:12,000 (A4)

N

Produced by the Department of Biodiversity, Conservation and Attractions

Graticule shown at 1 degree intervals
Grid shown at 10000 metre intervals

Produced at 11:30am, on June 24, 2024

Jensmore VS, van Dongen RJ, Ong R, Harris BG, 2022, OzCBI: the composite burn index adapted to assess fire severity and key fauna habitat features in Australian ecosystems, Australian Forestry, 86:1-21

Slide 32: Stakeholder presentation – Prescribed burning
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Department of Biodiversity, Conservation and Attractions

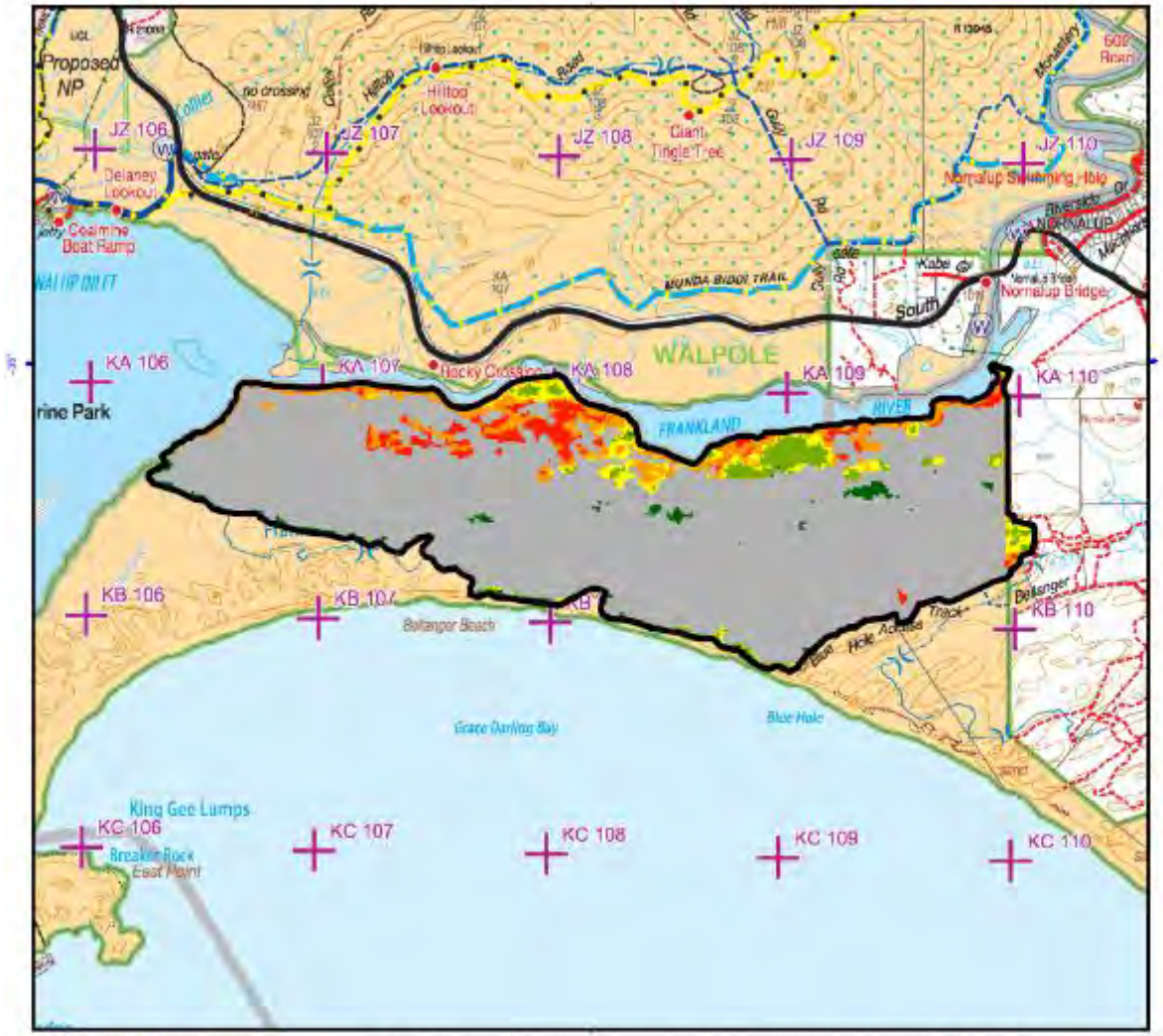
PARKS AND WILDLIFE SERVICE

FRK_074 Blue Holes

Slide 34: Stakeholder presentation – Prescribed burning
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE



Indicative Burn Severity Map

Blue Holes

Burn Id: FRK074

Date created: 27/02/2025

Latest satellite image: 2/01/2025

Legend

Treatment area

Unburnt:	2.39 %
Low:	3.05 %
Medium:	3.67 %
High:	6.49 %
Very high:	3.15 %
Burnt heath:	81.25 %

Total area: 726 ha

0 0.275 0.55 1.1 1.65 2.2
Kilometres

GDA2020 MGA Zone 50

1:38,000 (A4)

N

Produced by the Department of Biodiversity, Conservation and Attractions

Graticule shown at 1 degree intervals
Grid shown at 100000 metre intervals

Roads and tracks on land managed by DBCA may contain unmarked hazards and their surface condition is variable. Exercise caution and drive to conditions on all roads.

Produced at 11:30am, on June 24, 2024

Densmore VS, van Dongen RJ, Ong R, Harris BG, 2022, OzCBI: the composite burn index adapted to assess fire severity and key fauna habitat features in Australian ecosystems, Australian Forestry, 86:1-21

Slide 35: Stakeholder presentation – Prescribed burning Walpole 11 June 2025

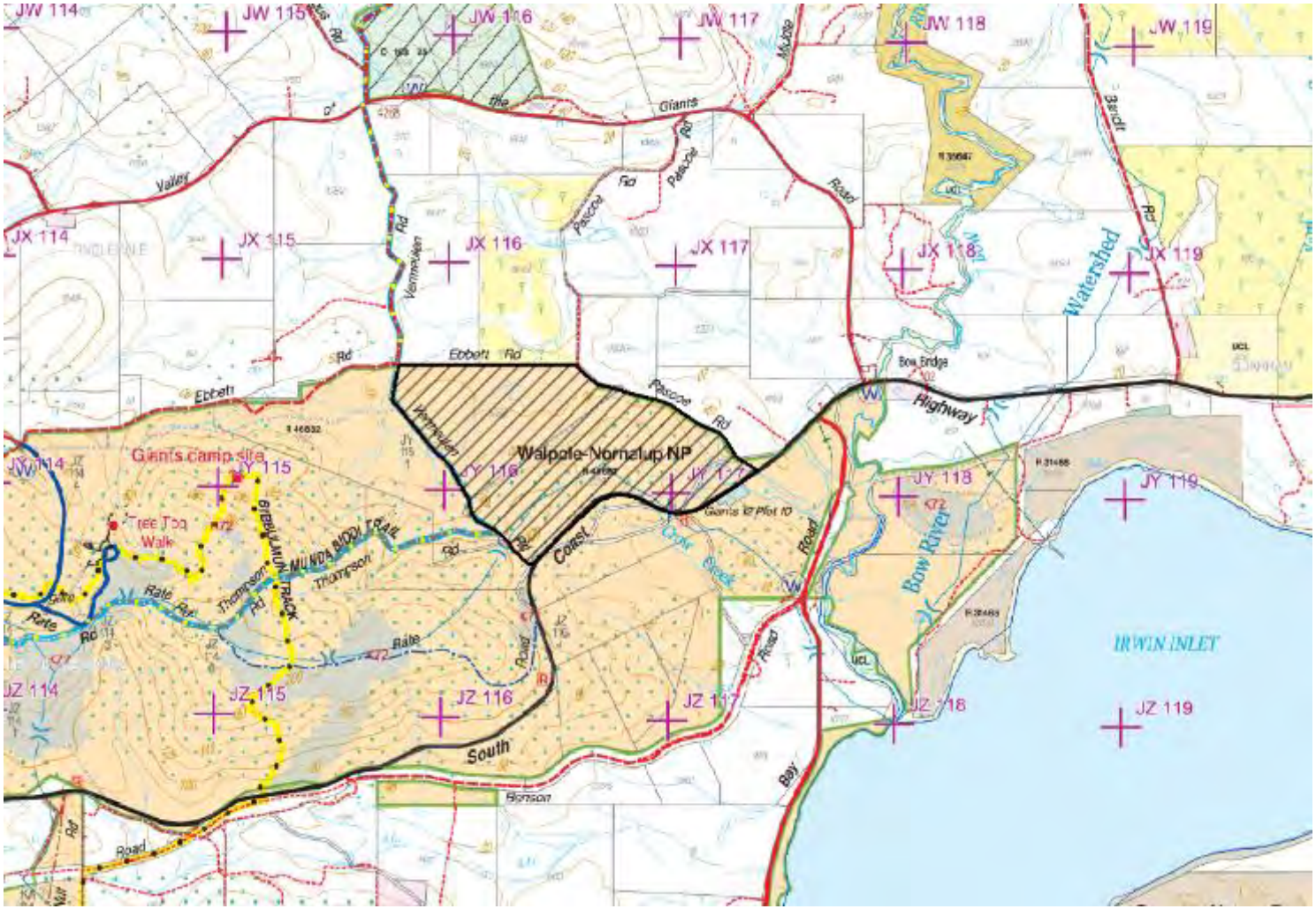
Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

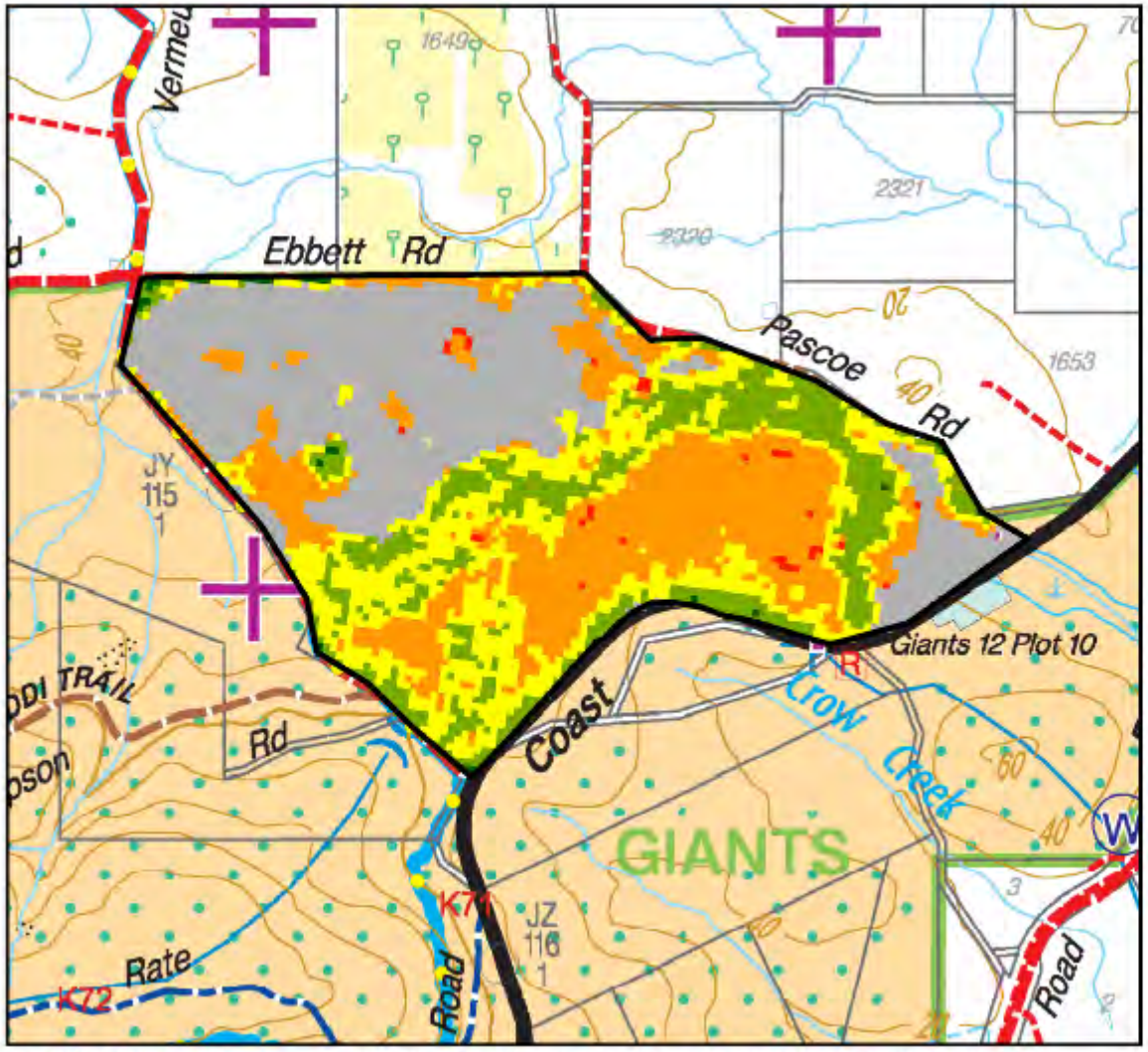
FRK_111 Giants East



Slide 37: Stakeholder presentation – Prescribed burning
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE



Indicative Burn Severity Map

Giants East

Burn Id: FRK111

Date created: 19/03/2025

Latest satellite image: 16/02/2025

Legend

Treatment area

Unburnt:	0.78 %
Low:	15.83 %
Medium:	21.86 %
High:	26.79 %
Very high:	0.68 %
Burnt heath:	34.06 %

Total area: 206 ha

0 0.1 0.2 0.4 0.6 0.8
Kilometres

GDA2020 MGA Zone 50

1:15,870 (A4)

N

Produced by the Department of Biodiversity, Conservation and Attractions

Gratcule shown at 1 degree intervals
Grid shown at 100000 metre intervals

The Dept. of Biodiversity, Conservation and Attractions does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence which may arise from relying on any information depicted.

Roads and tracks on land managed by DBCA may contain unmarked hazards and their surface condition is variable. Exercise caution and drive to conditions on all roads.

Produced at 11:39am, on June 24, 2024

Slide 38: Stakeholder presentation – Prescribed burning Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Slide 39: Stakeholder presentation – Prescribed burning
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

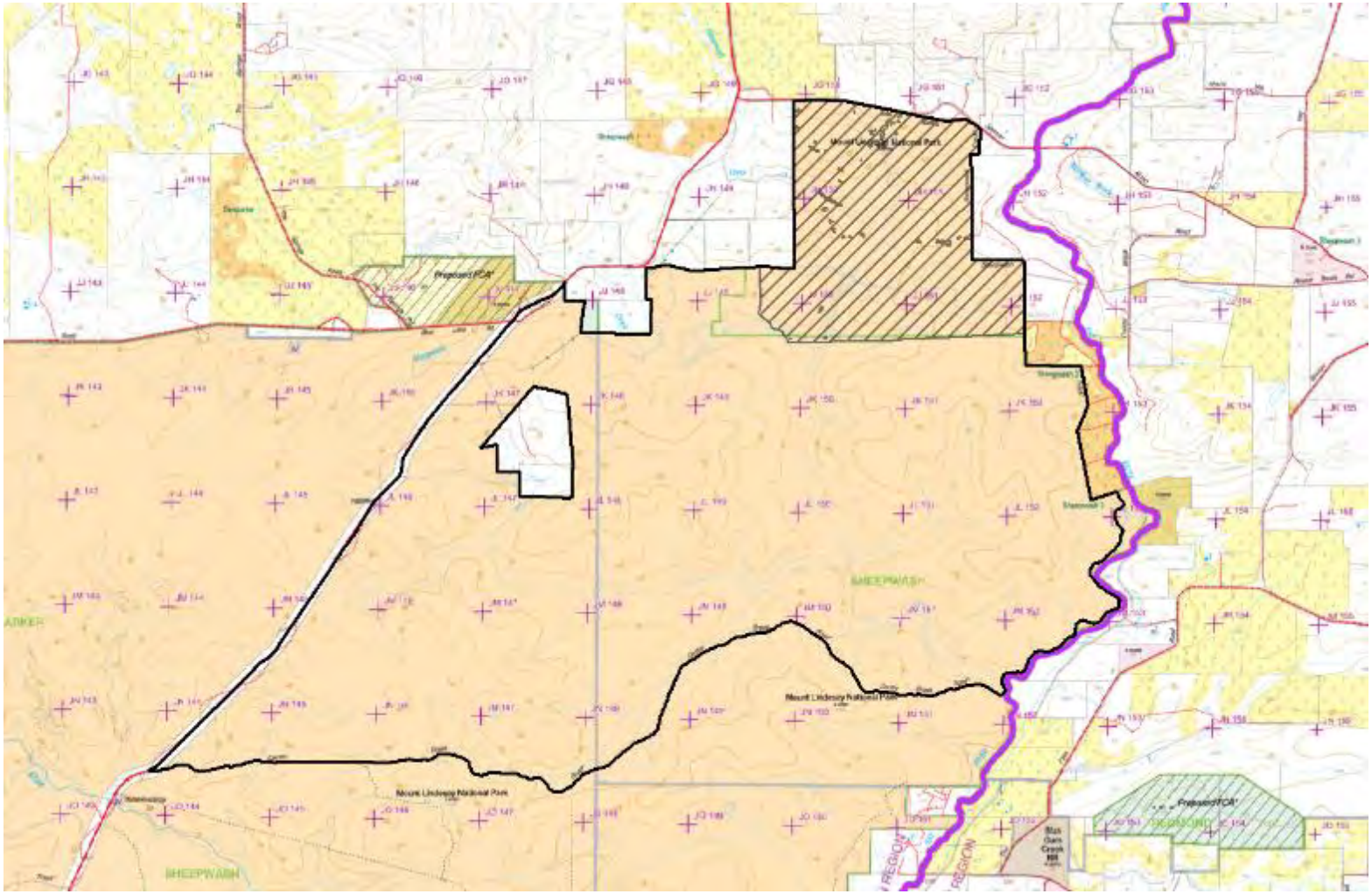
PARKS AND WILDLIFE SERVICE

Slide 41: Stakeholder presentation – Prescribed burning
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

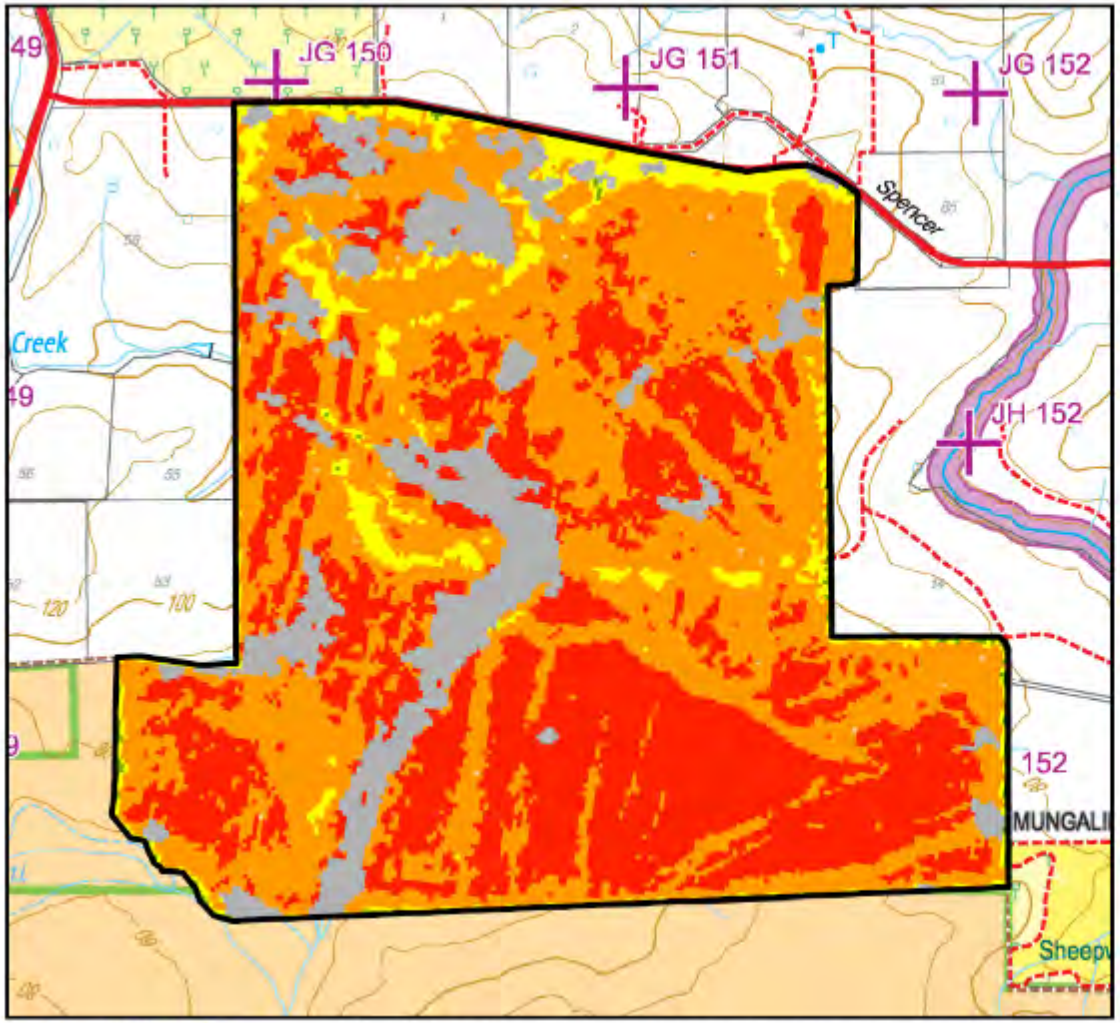
FRK_094 Sheepwash North



Slide 43: Stakeholder presentation – Prescribed burning
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE



Indicative Burn Severity Map

Sheepwash North

Burn Id: FRK094

Date created: 27/02/2025

Latest satellite image: 23/12/2024

Legend

Treatment area

Unburnt:	0.08 %
Low:	0.77 %
Medium:	6.04 %
High:	46.92 %
Very high:	34.74 %
Burnt heath:	11.46 %

Total area: 1134 ha

0 0.175 0.35 0.7 1.05 1.4
Kilometres

GDA2020 MGA Zone 50 1:25,000 (A4)

N

Produced by the Department of Biodiversity, Conservation and Attractions

Graticule shown at 1 degree intervals
Grid shown at 100000 metre intervals

The Dept. of Biodiversity, Conservation and Attractions does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence which may arise from relying on any information depicted.

Roads and tracks on land managed by DBCA may contain unmarked hazards and their surface condition is variable. Exercise caution and drive to conditions on all roads.

Produced at 11:30am, on June 24, 2024

Jensmore VS, van Dongen RJ, Ong R, Harris BG, 2022, OzCBI: the composite burn index adapted to assess fire severity and key fauna habitat features in Australian ecosystems, Australian Forestry, 86:1-21

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

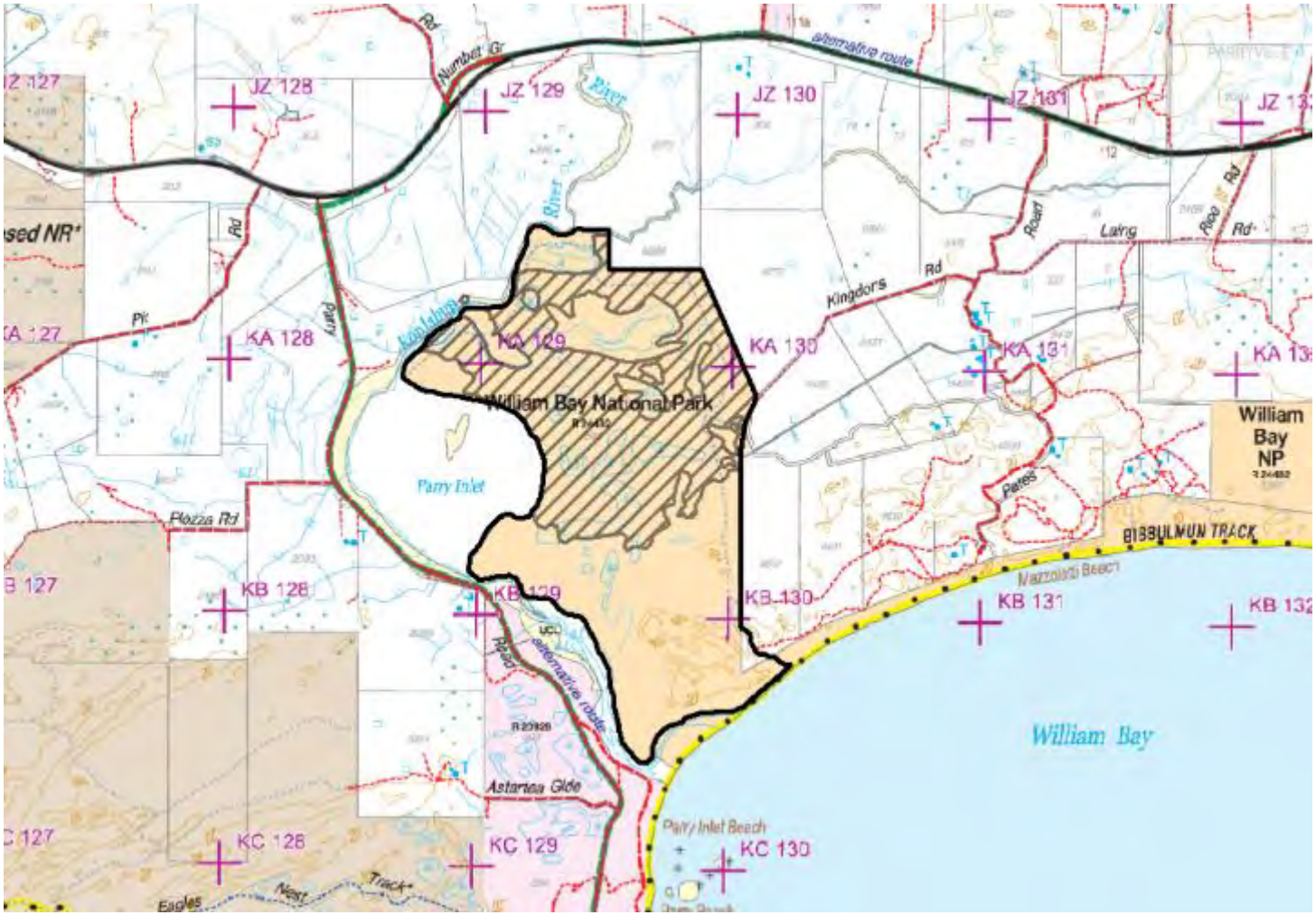
Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

FRK_061 Parry Inlet



Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Slide 49: Stakeholder presentation – Prescribed burning Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Prescribed Burning – Frankland District History

Year	Number of burns commenced	Area Treated	Area burnt	Number Escapes	Total Area of Escapes (ha)	% of Total Frankland District Area (Treated)	% of DBCA Frankland managed estate (Treated)	Average return interval	Number bushfires	Area bushfire
2024/25	8	17,506	15,573	1	1	2.6	4.7	21 Years	10	219
2023/24	12	15,898	12,585	-	-	2.3	4.2	24 years	12	13,997
2022/23	7	16,750	15,508	1	9,642	2.5	4.5	22 years	9	9,884
2021/22	10	17,640	14,263	-	-	2.6	4.7	21 years	6	2,100
2020/21	11	19,835	16,590	1	6	2.9	5.3	19 years	8	302
2019/20	11	31,371	30,667	-	-	4.6	8.4	12 years	6	0.3
2018/19	12	34,322	31,408	1	15	5.1	9.2	11 years	11	52

Bushfires 2024-25

Warren Region

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

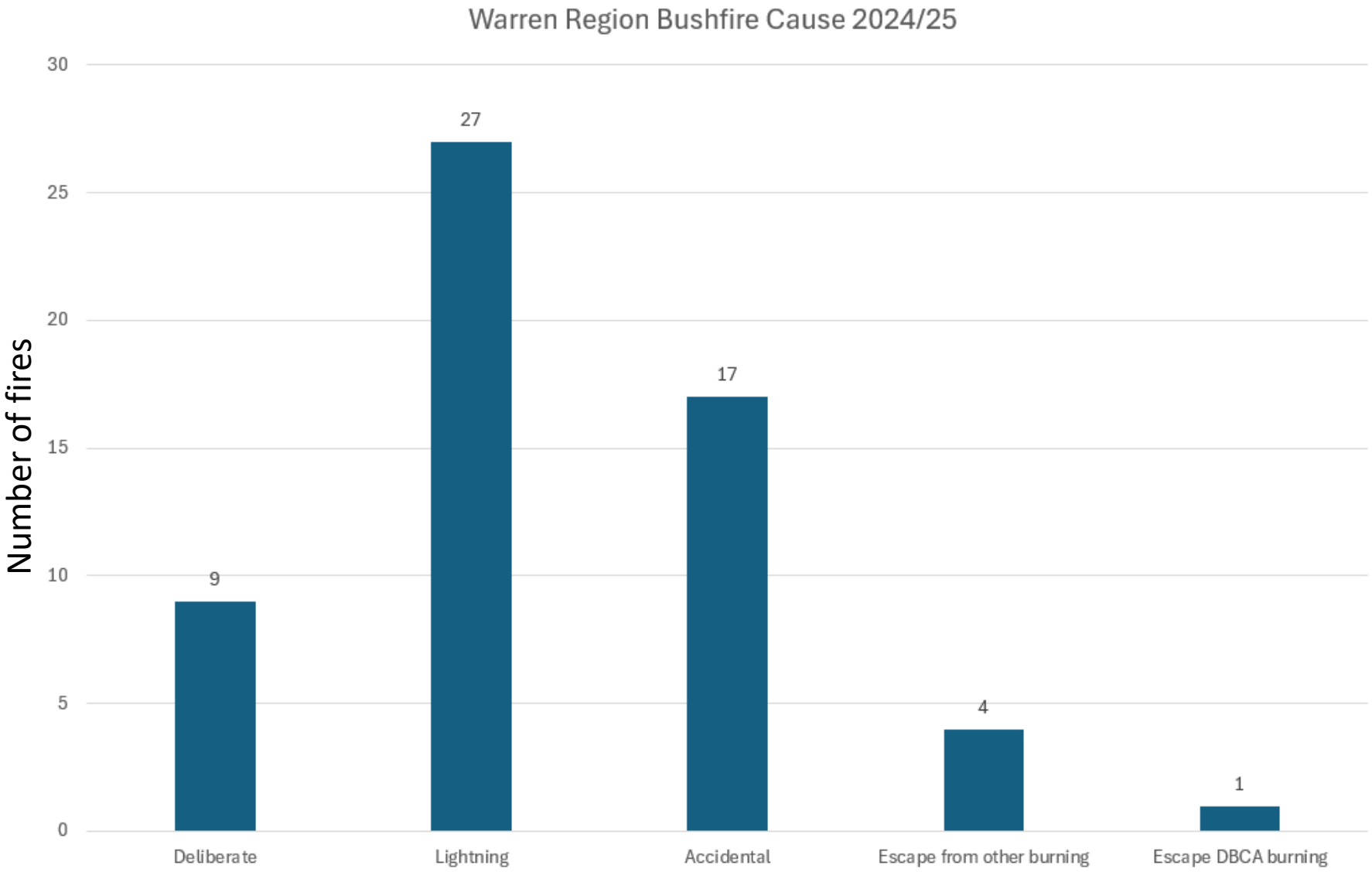
58 fires attended to by DBCA in Warren Region

10 fires in Frankland
48 fires in Donnelly

One larger fire in Frankland
and a major complex set of fires in Donnelly

Department of Biodiversity, Conservation and Attractions

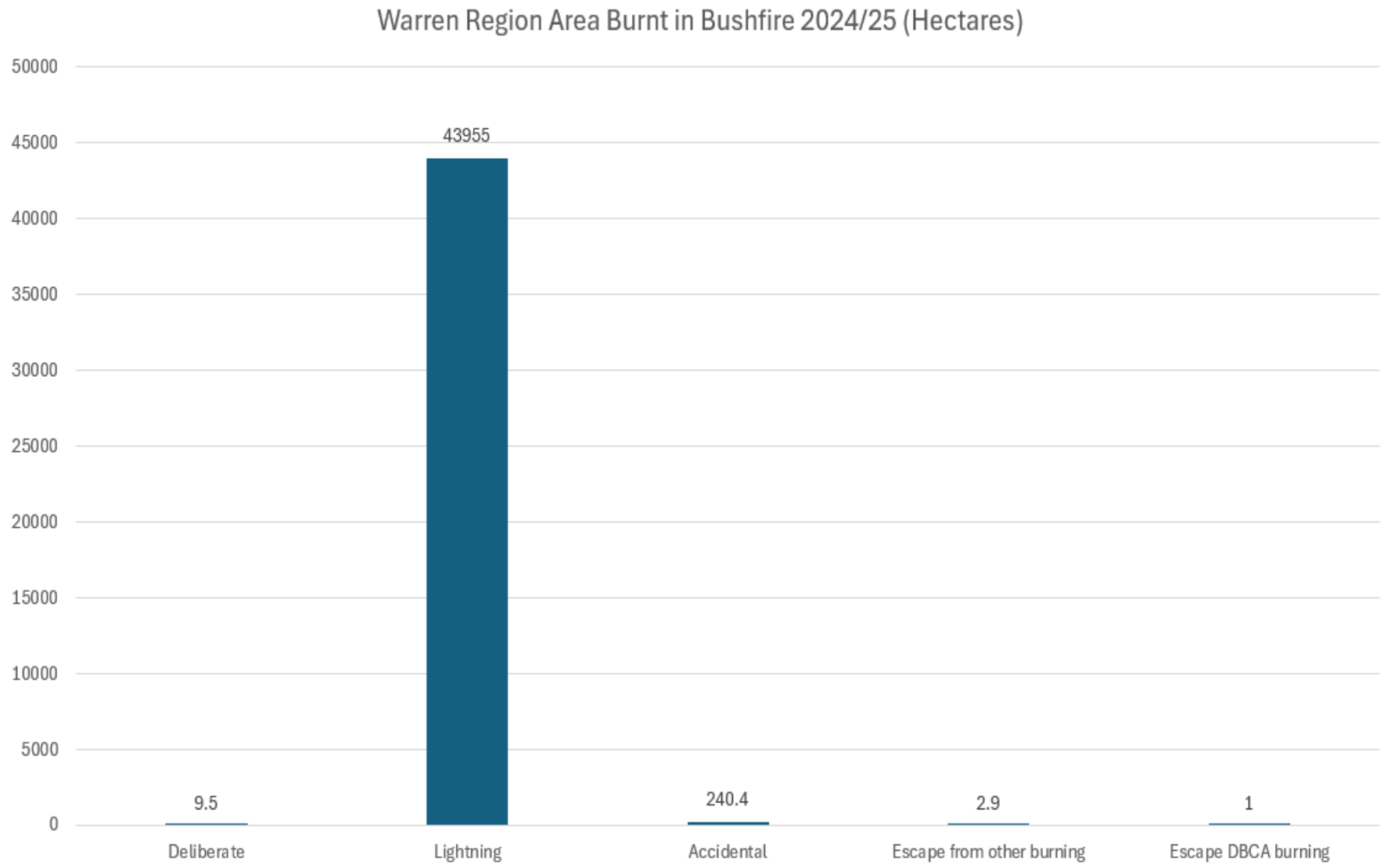
PARKS AND WILDLIFE SERVICE



Slide 53: Stakeholder presentation - Bushfires
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE



Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Peaceful Bay/Bow Bridge FRK Fire 006

- 2 January 2025
- Escape from private property. Illegal fire lit on private property
- 204 hectares
- Burnt through 167 hectares of National Park and Nature Reserve and 37 hectares of private property and other crown land
- Supported by water bombers and local brigade crews
- Travelling at 1.5 kms per hour

Slide 55: Stakeholder presentation - Bushfires
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Slide 56: Stakeholder presentation - Bushfires
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Slide 57: Stakeholder presentation - Bushfires
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Slide 58: Stakeholder presentation - Bushfires
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Slide 59: Stakeholder presentation - Bushfires
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Slide 60: Stakeholder presentation - Bushfires
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Slide 61: Stakeholder presentation - Bushfires
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Slide 62: Stakeholder presentation - Bushfires
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

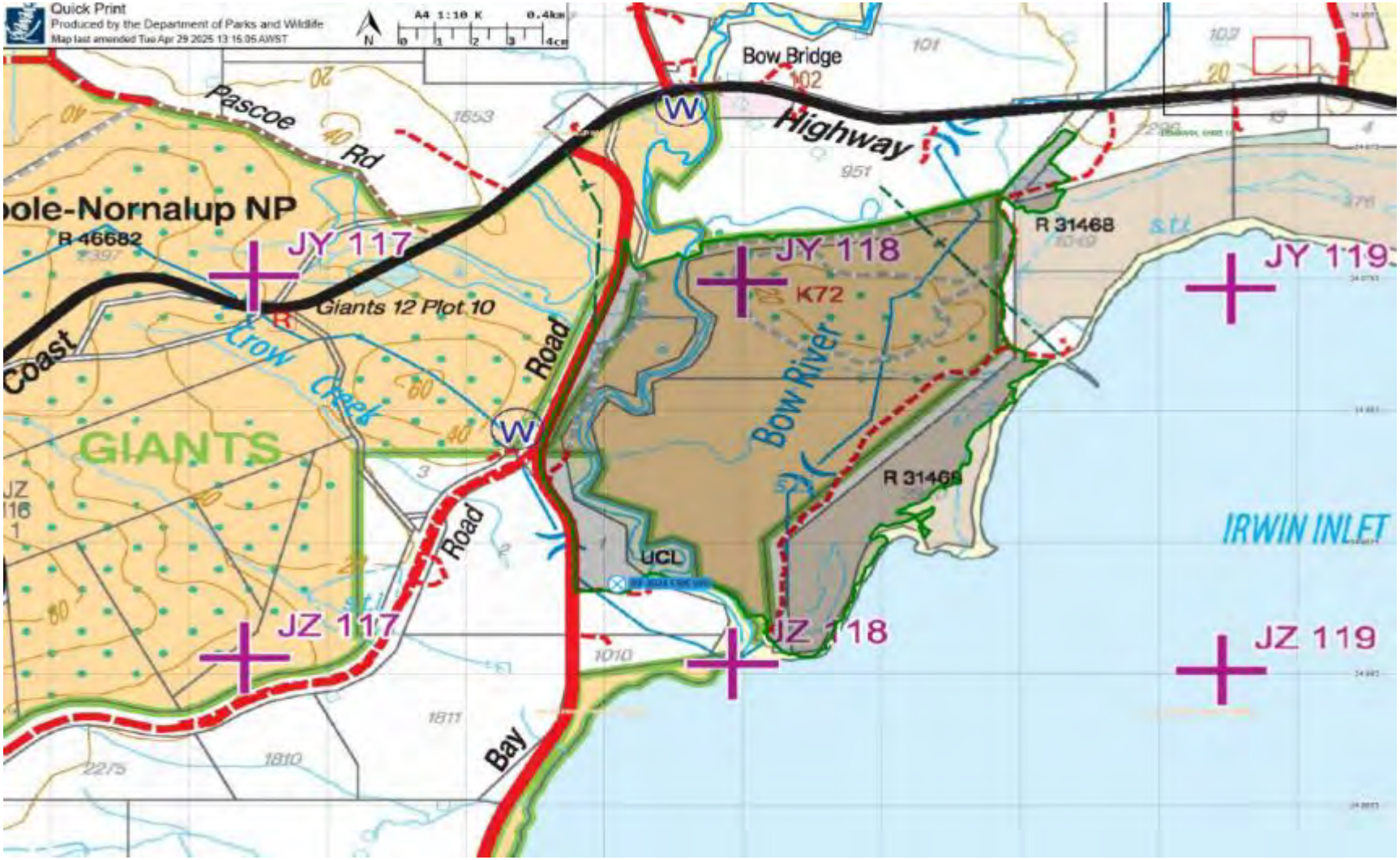
Slide 63: Stakeholder presentation - Bushfires
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE



Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Donnelly Complex Fires

- 14 Fires
- Lightning event in early hours of the morning
- 9 February 2025
- Long duration over 33 days
- Involved 5 Pre-formed teams from across the state
- Had assistance from interstate
- Emergency warning for Windy Harbour settlement
- SW Hwy closed for a couple of days

Fire Number	Fire Name	Detection Date/Time	Resource Despatched Date /Time	Controlled Date/Time	Fuel Age	Total Area (ha)
DON-011	Collins	9/02/2025 06:20	9/02/2025 06:50	9/02/2025 11:48	69	1.1
DON-012	Eastbrook	9/02/2025 08:15	9/02/2025 08:20	9/02/2025 19:30	25	0.1
DON-013	Wildwood Road	9/02/2025 10:00	9/02/2025 10:10	9/02/2025 18:00	21	0.2
DON-014	Waistcoat Road	9/02/2025 10:00	9/02/2025 10:12	9/02/2025 16:18	43	2.51
DON-015	O'Sullivan Road	9/02/2025 10:00	9/02/2025 10:11	22/02/2025 16:16	10	3,283
DON-016	Beavis	9/02/2025 10:16	9/02/2025 10:17	17/02/2025 Burnt out to strategic roads	16	2,168
DON-017	Chesapeake	9/02/2025 10:19	9/02/2025 10:19	14/03/2025	10	37,370
DON-018	Quinninup	9/02/2025 10:24	9/02/2025 10:25	9/02/2025 18:47	15	1.8
DON-019	Sutton Road	9/02/2025 10:28	9/02/2025 10:29	9/02/2025 15:00	40	0.1
DON-020	Maringup	9/02/2025 11:27	9/02/2025 11:27	18/02/2025 18:00 Included into Chesapeake fire	13	1.2
DON-021	Donnelly River	9/02/2025 11:31	9/02/2025 11:31	9/02/2025 18:54	16	0.4
DON-022	Dog Road	9/02/2025 11:49	9/02/2025 11:49	Included into DON-015	10	16.06
DON-023	Edwards Road	9/02/2025 14:56	9/02/2025 15:00	9/02/2025 18:15	10	1.6
DON-024	Kessell Road	09/02/2025 22:52	10-02-2025 07:00	10/02/2025	21	33

Table 1 – Summary of Lightning strike caused bushfire occurring in Donnelly District from the 9/2/2025

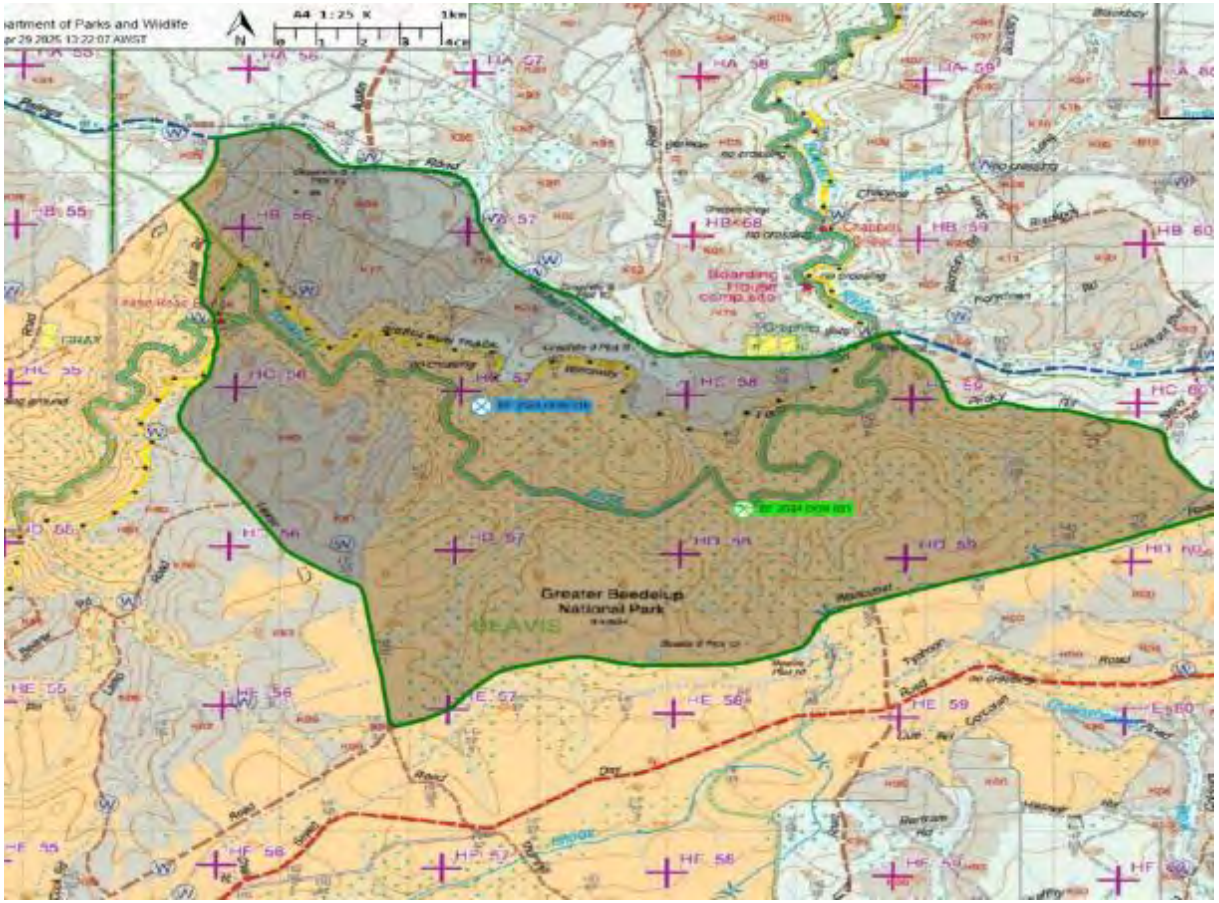
Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Map showing origin of 14 lightning strike fires that occurred on 9 February 2025.
NB: Above map does not show Chesapeake Escape on 5th March.

Beavis – DON 016

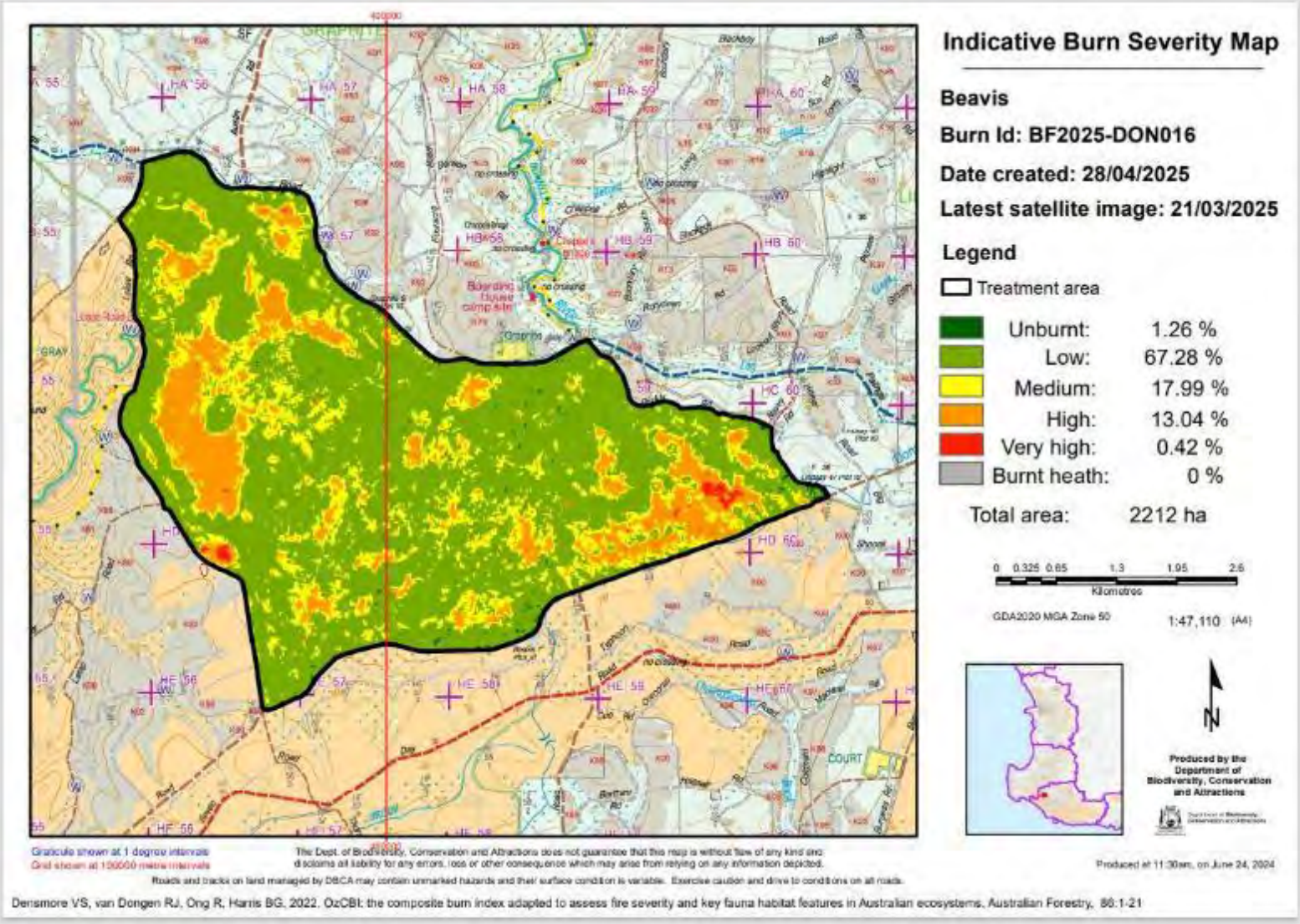
- Detected 9 February 2025
- 2197 hectares
- Lightning cause
- Water bombers attempted to suppress fire
- Could not track the fire edge as the area was in steep, rocky inaccessible terrain. Too hazardous to manually put a firebreak around the fire.
- Decision was to burn out to strategic roads under prescribed burn conditions.



Slide 68: Stakeholder presentation - Bushfires
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

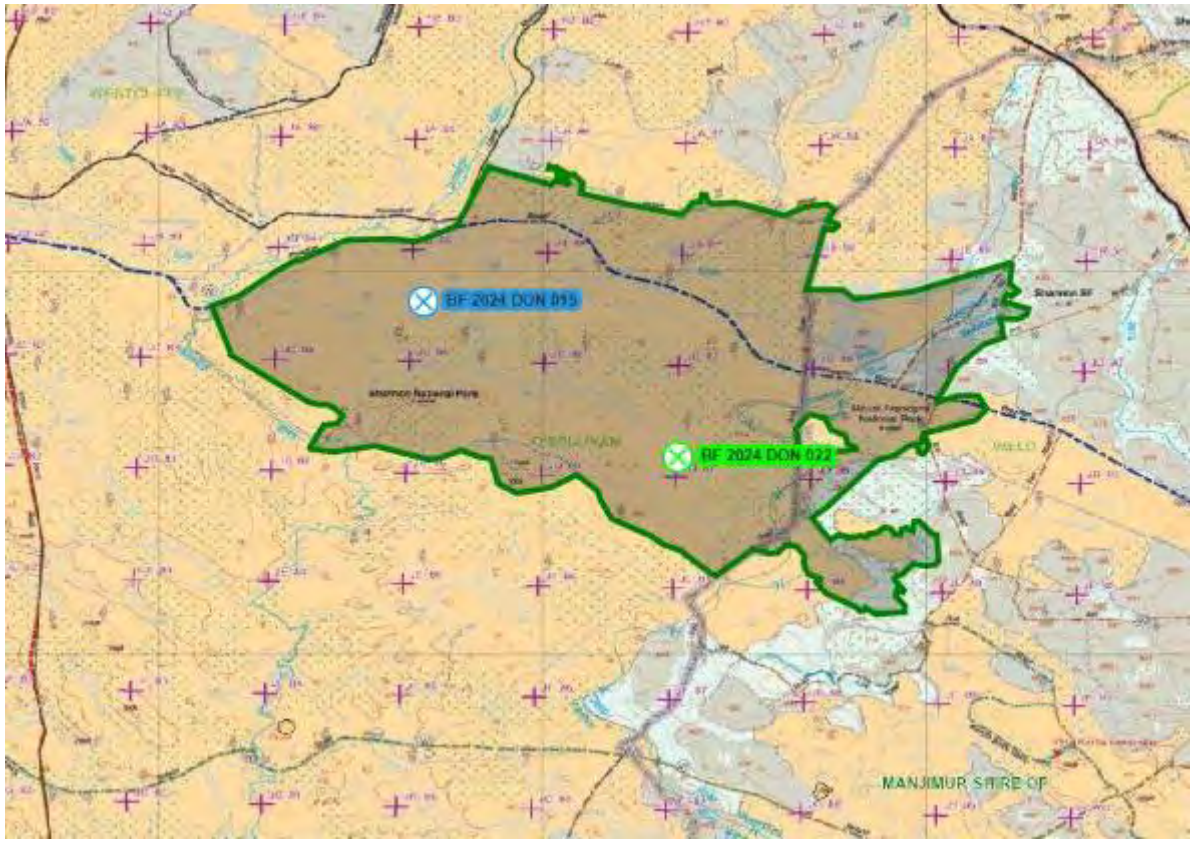
PARKS AND WILDLIFE SERVICE



Densmore VS, van Dongen RJ, Ong R, Harris BG. 2022. OzCBI: the composite burn index adapted to assess fire severity and key fauna habitat features in Australian ecosystems. Australian Forestry. 86:1-21

O'Sullivan DON 015

- Detected 9 February 2025
- Lightning cause
- 3,283 hectares
- 10 years since last fire. Last burnt in the O'Sullivan bushfire
- Strategy was to fall back to strategic roads due to fast moving fire



Slide 70: Stakeholder presentation - Bushfires
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Slide 71: Stakeholder presentation - Bushfires
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Slide 72: Stakeholder presentation - Bushfires
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Slide 73: Stakeholder presentation - Bushfires
Walpole 11 June 2025

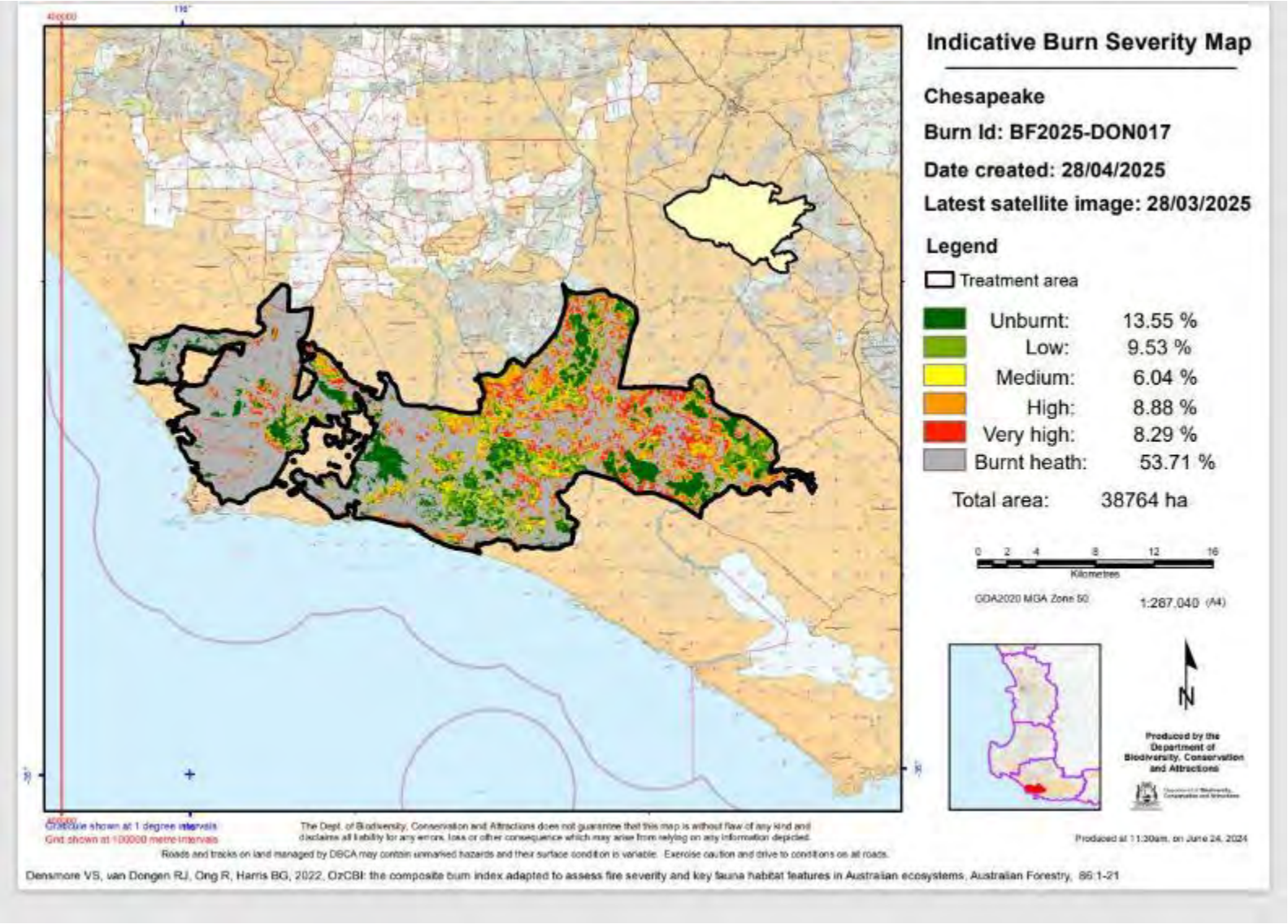
Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Slide 74: Stakeholder presentation - Bushfires
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE



Density VS, van Dongen RJ, Ong R, Harris BG, 2022. OzCBI: the composite burn index adapted to assess fire severity and key fauna habitat features in Australian ecosystems. Australian Forestry, 86:1-21

Slide 75: Stakeholder presentation - Bushfires
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Burn Options Program 2025-26
Frankland District

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

DBCA Burn Options Program

Approved by DBCA Director General

Endorsed by Executive Director

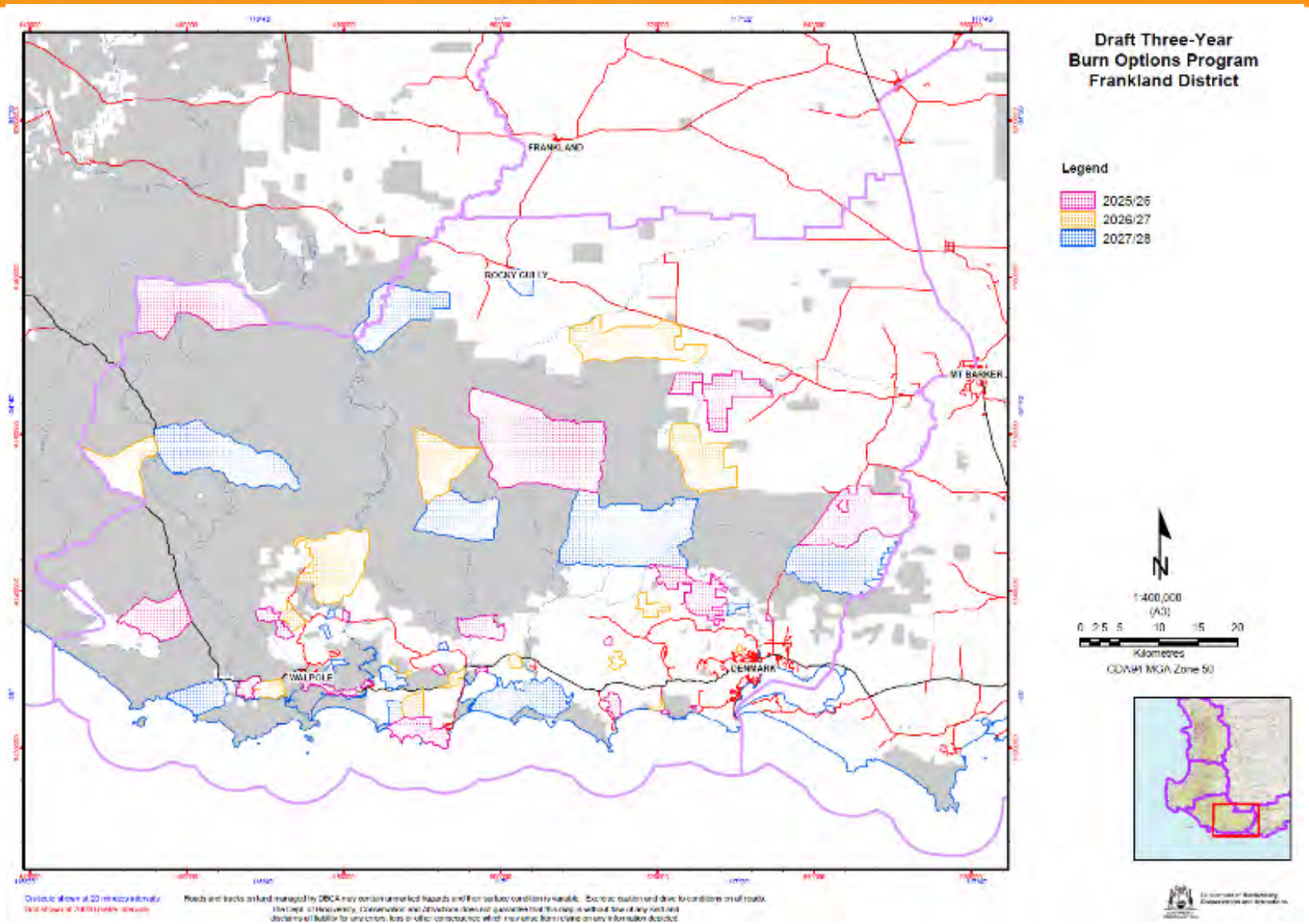
Endorsed by the Regional Team

Developed by the District Team

Slide 78: Stakeholder presentation - Burn Options Program
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

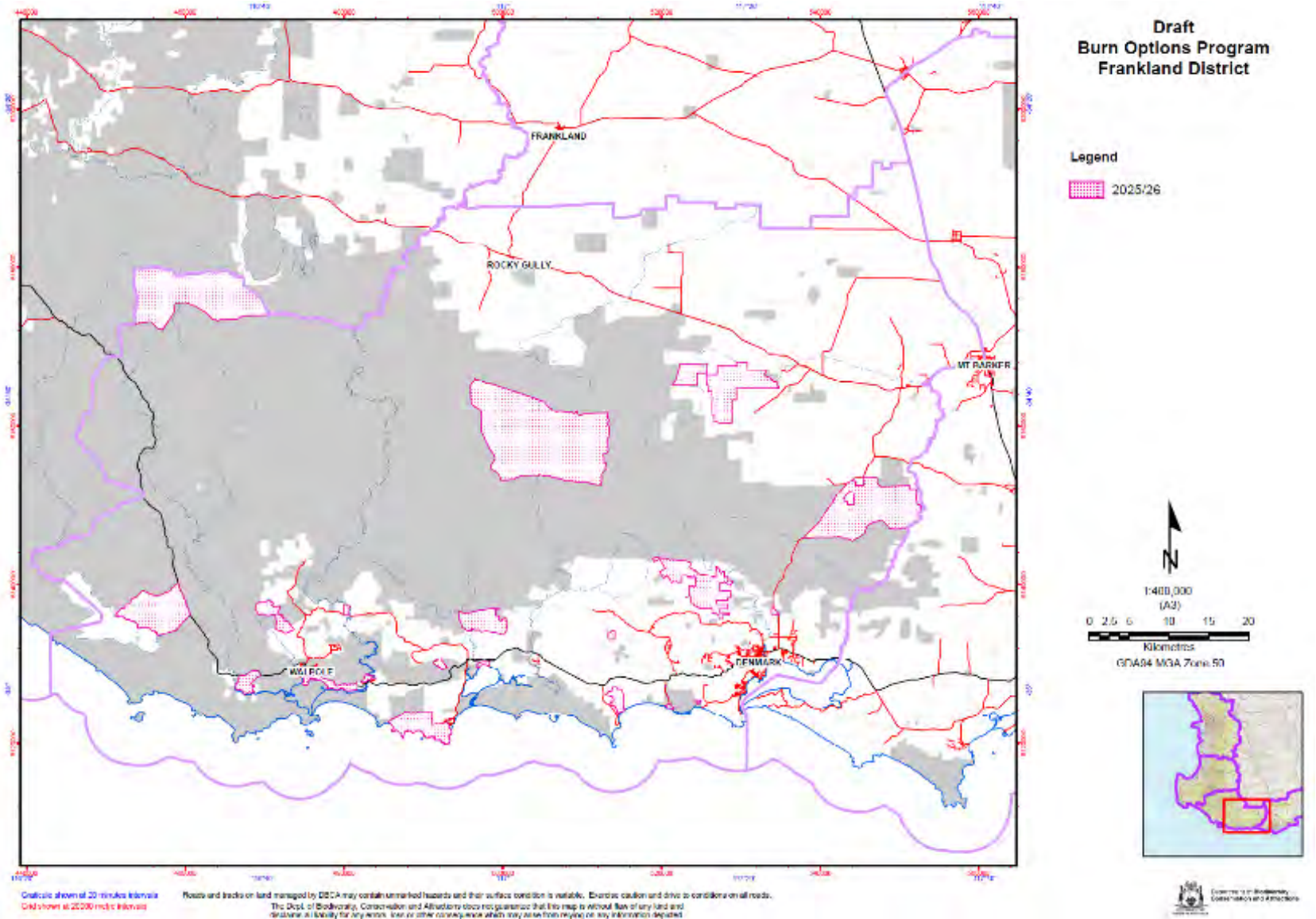
PARKS AND WILDLIFE SERVICE



Slide 79: Stakeholder presentation - Burn Options Program
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

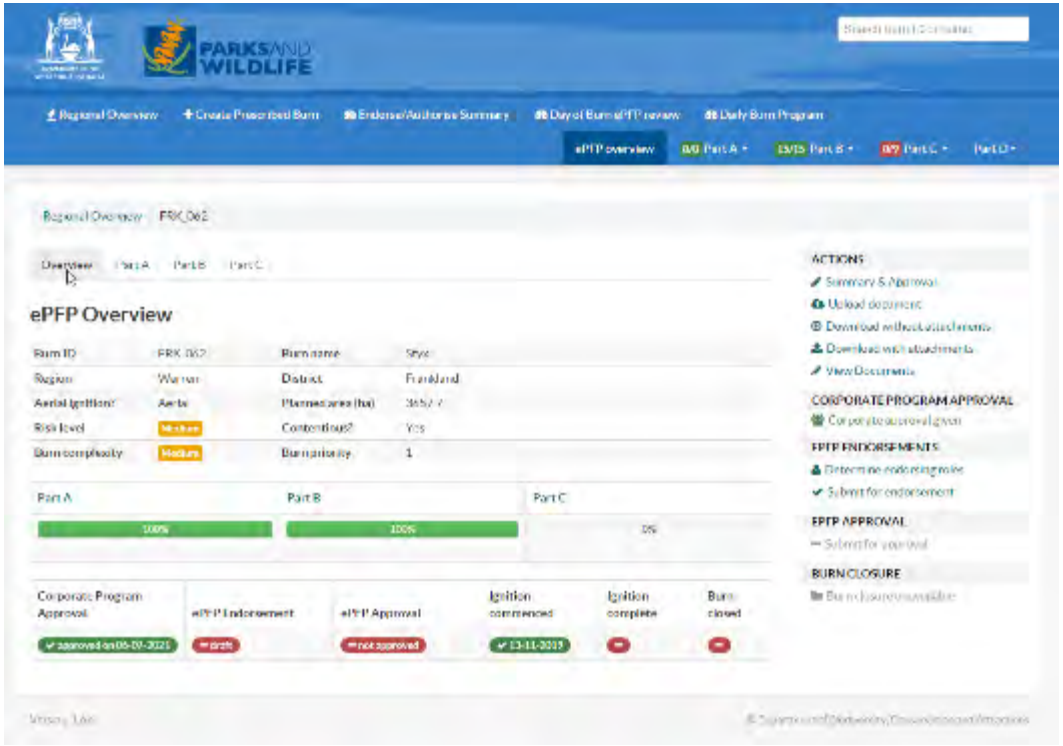


Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

3-6 months prior

- Prescribed Fire Plan
  - Objectives
  - Success criteria
  - Values in the area
  - Pre-Burn inspections
  - Maps
  - Fuel measurements
  - Prescribed fire behaviour
  - Approvals
  - Traffic Management Plan
  - Contingency Plan
  - Risk Analysis



Approvals and Notifications

- DBCA - District/Regional/State
- Minister approval to include non-CALM tenure
- PP owners agreements
- s40 BC Act approvals
- ARC infrastructure
- DFES
- Prohibited Season exemptions
- Local Governments
- Main Roads
- Regional ILUA groups
- DPLH
- Western Power
- Telstra
- Vineyard Associations
- Water Corporation
- DWER
- Neighbour notifications

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Spring

- Widespread moisture in landscape = more patchiness
- Lower scorch
- Gradual drying of vegetation and vegetation types
- Wider window of opportunity for burning

- Potential for reignition (and escape) throughout summer

Autumn

- Winter rainfall prevents reignition
- Grass intrusion/
- Weed/Introduced species management

- Landscape is more uniformly dry = less patchiness
- Higher scorch
- Potential impacts on winery industry
- Generally short window due to rainfall

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

DBCA Day of Burn Approval Process

State Duty Officer

Regional Duty Officer

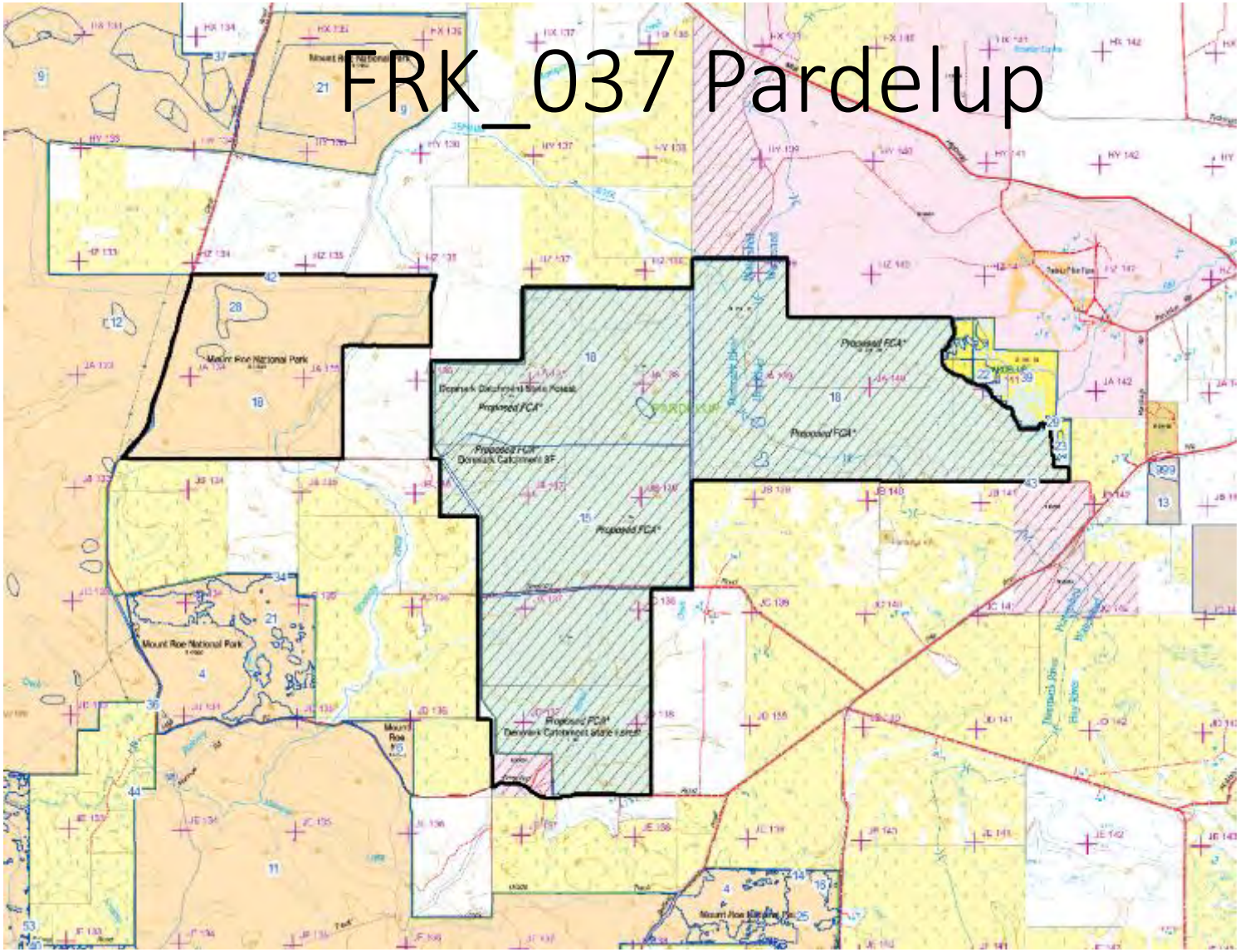
District Duty Officer

Overview

19 burns on Burn Options Program 2025/26

- 8 carry over burns from 24-25 with previous ignitions
- 5 carry over burns from 24-25 with no previous ignitions
- 6 burns new to the program

FRK_037 Pardelup



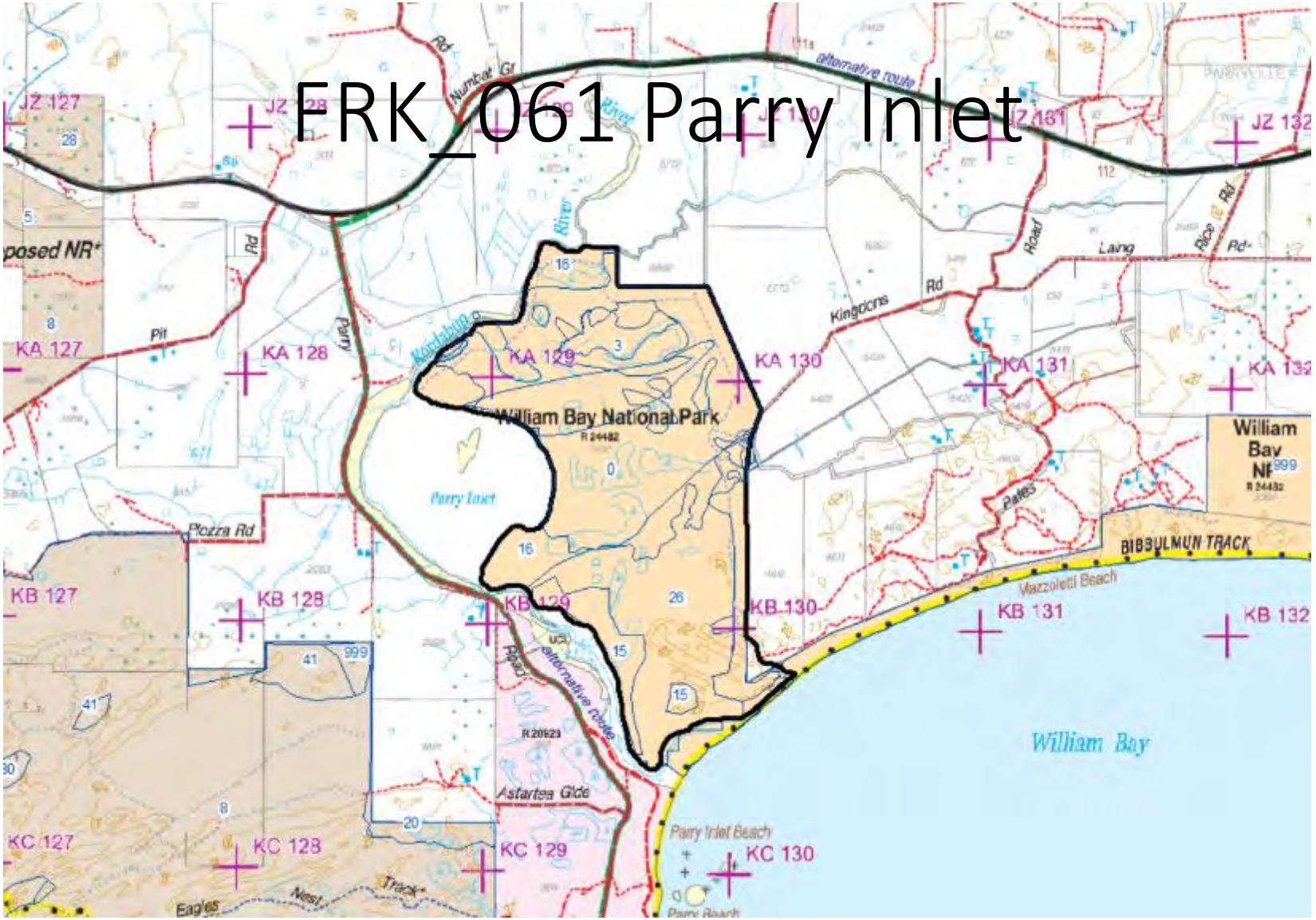
Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

FRK_039 William Bay

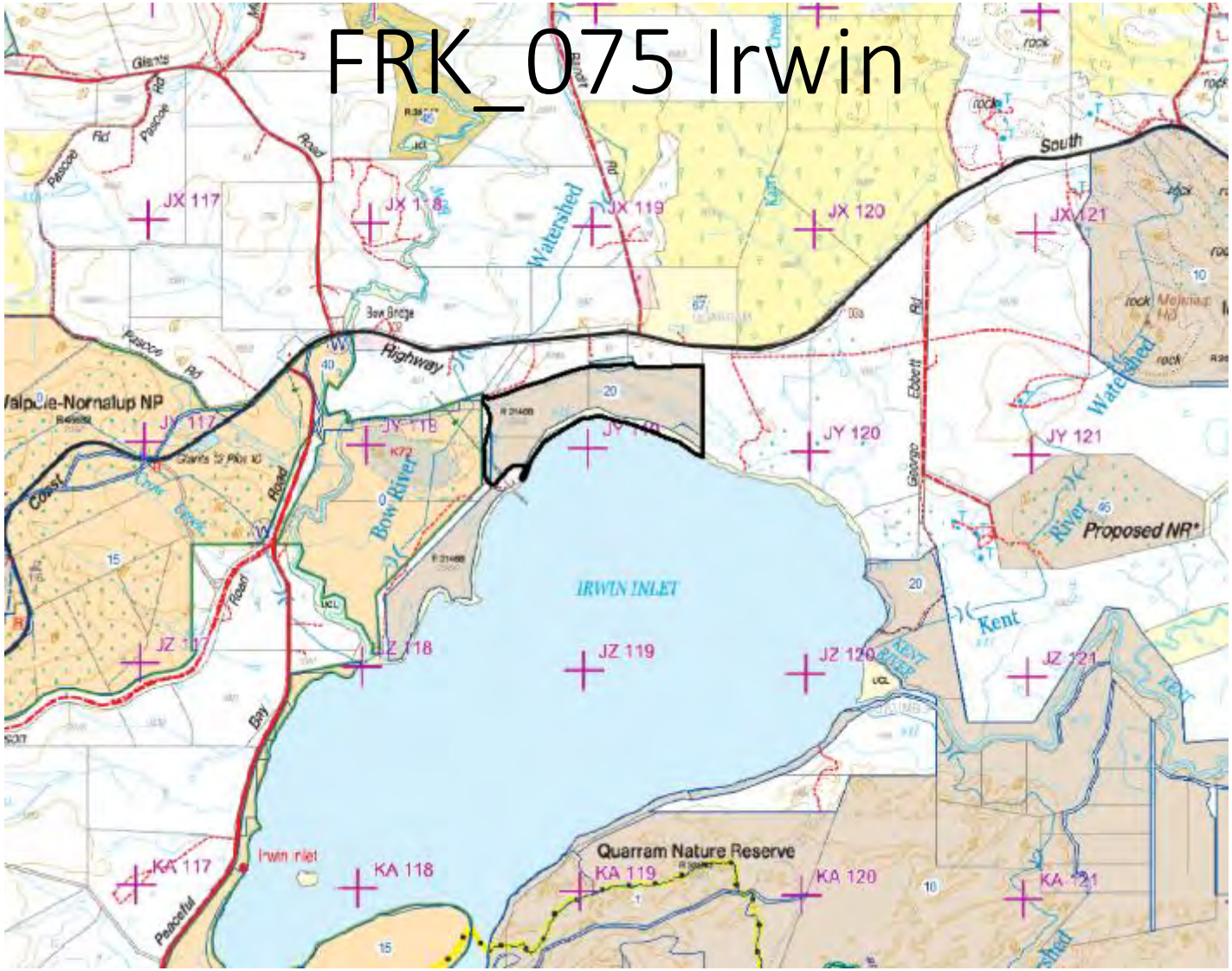
Department of Biodiversity, Conservation and Attractions

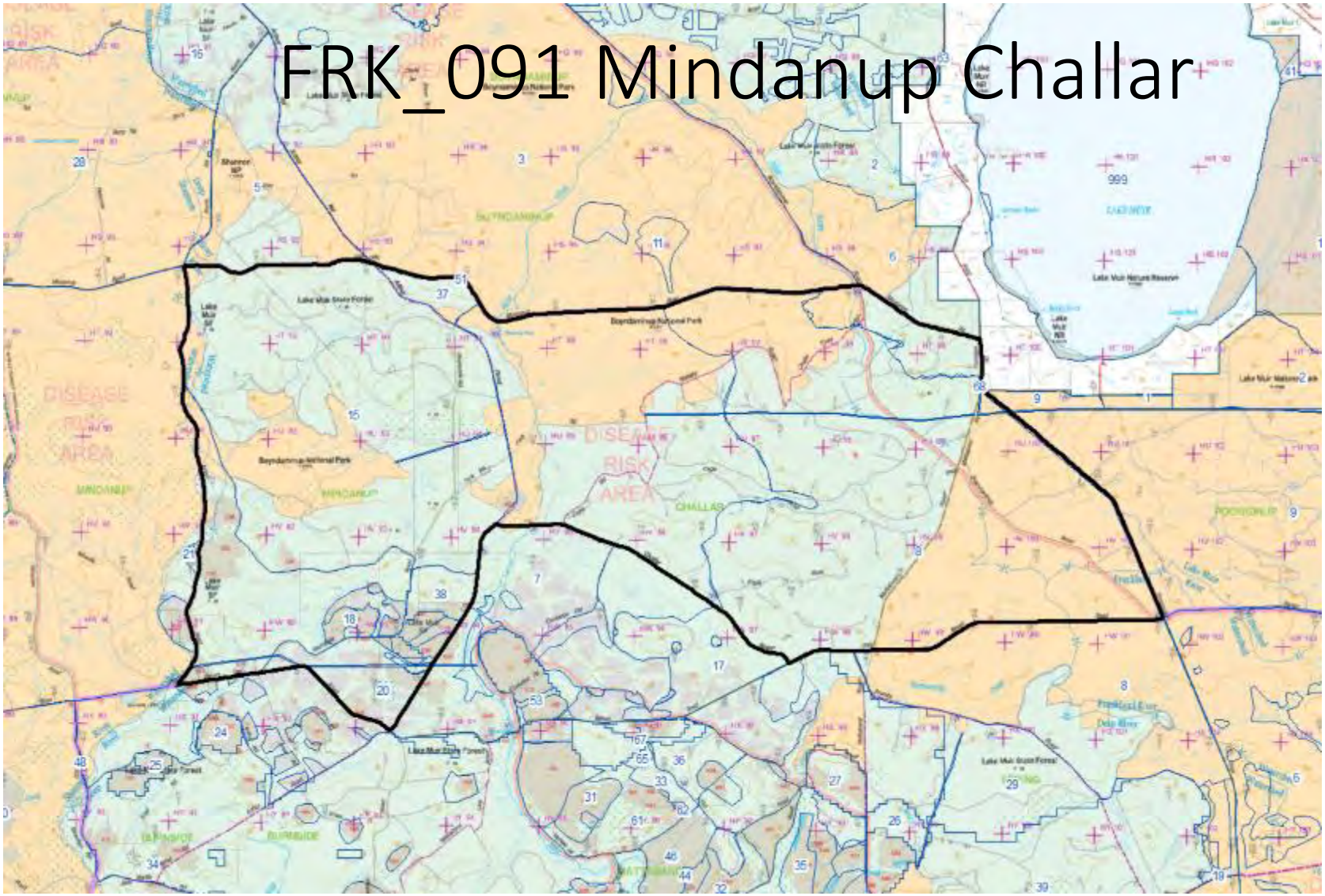
PARKS AND WILDLIFE SERVICE



Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

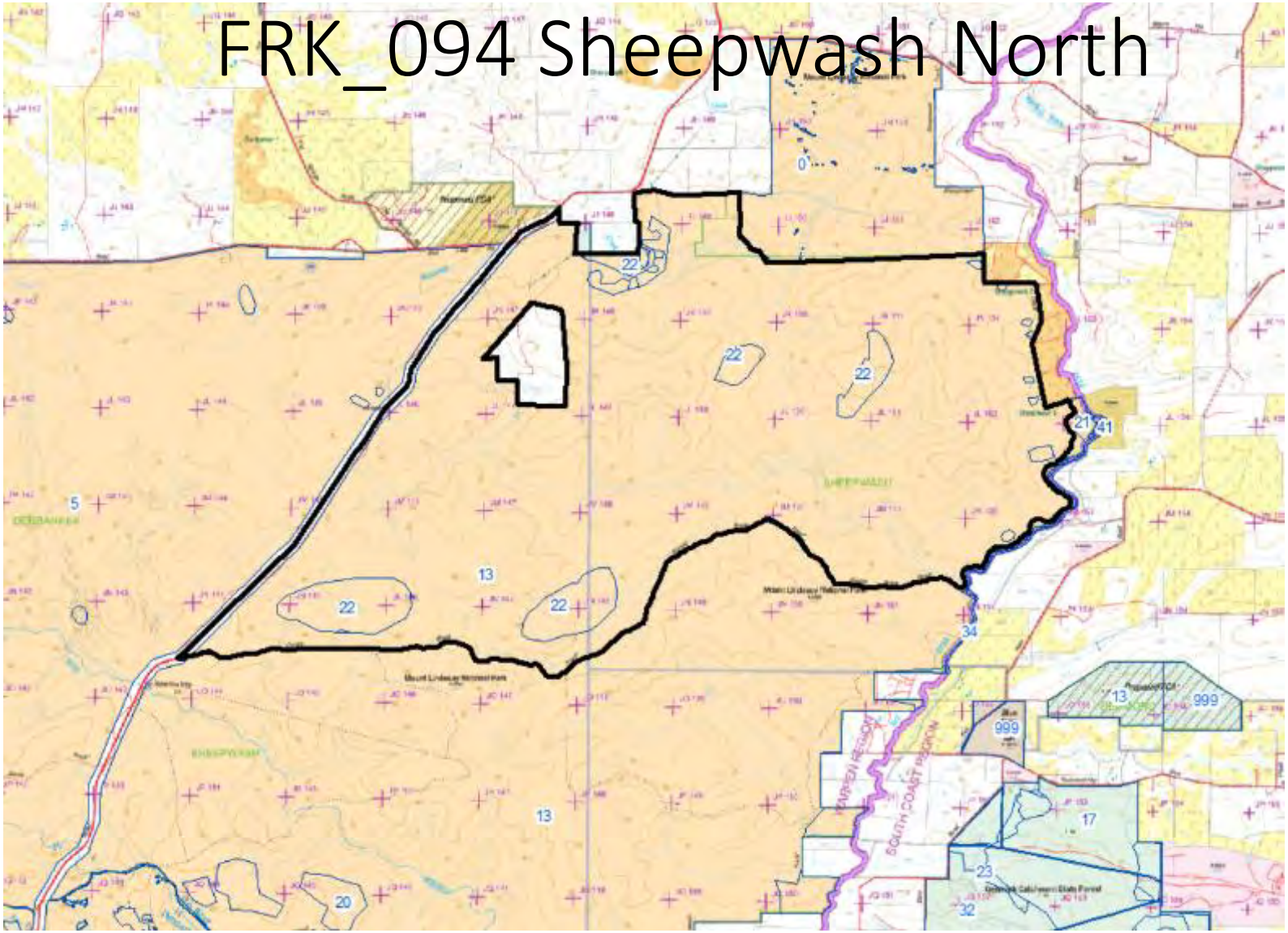



FRK_091 Mindanup Challar

Department of Biodiversity, Conservation and Attractions

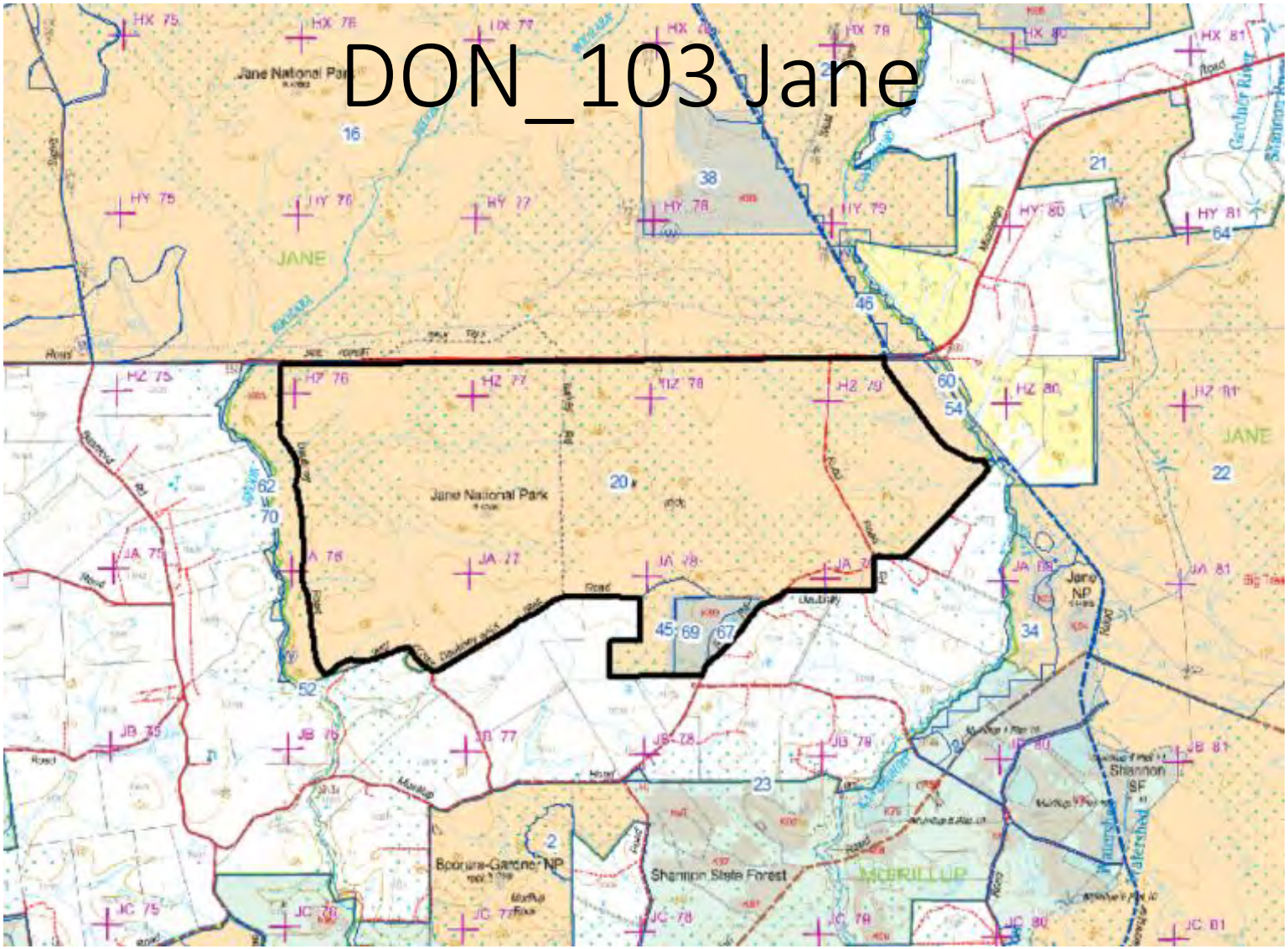
PARKS AND WILDLIFE SERVICE

FRK_094 Sheepwash North



Department of Biodiversity, Conservation and Attractions

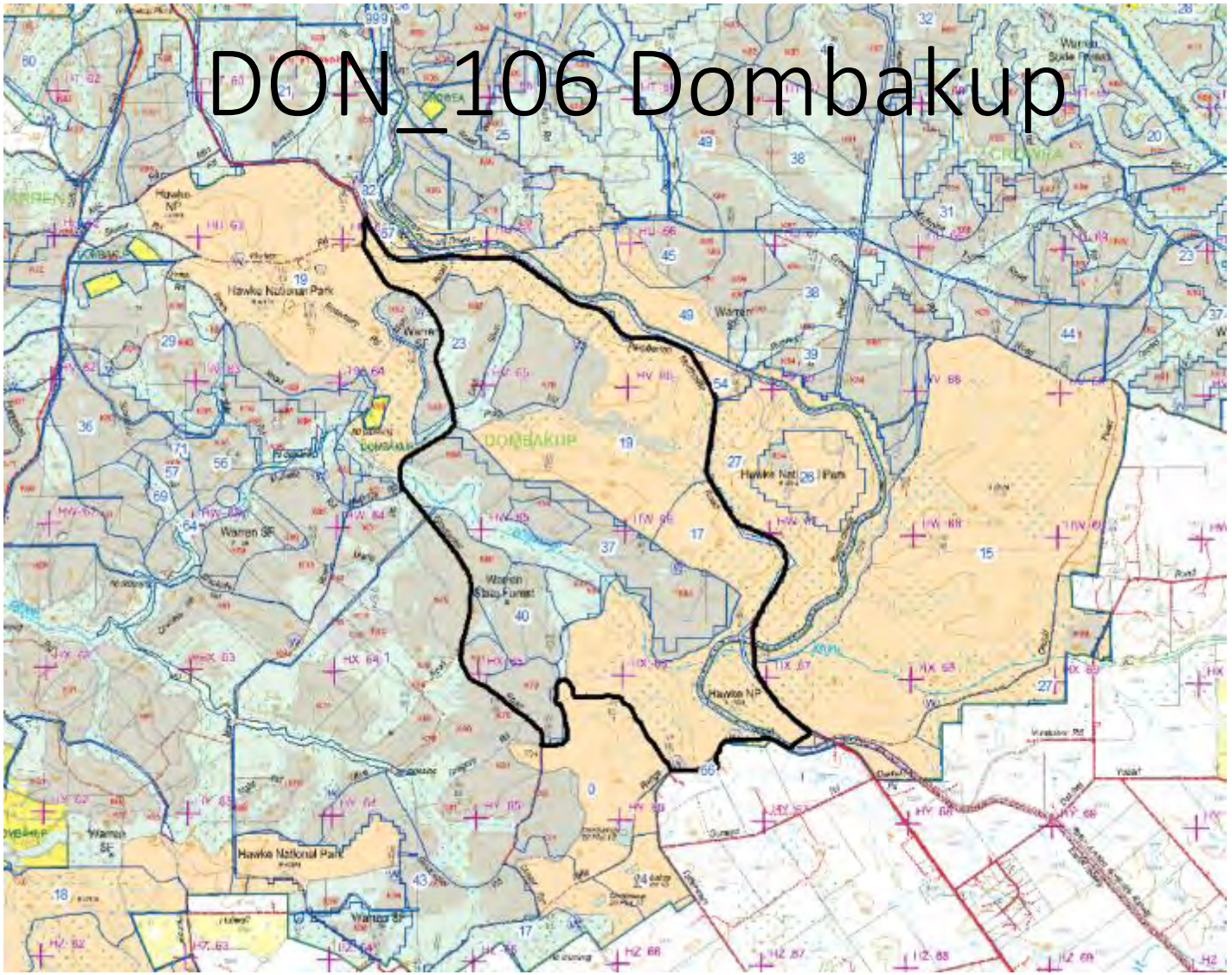
PARKS AND WILDLIFE SERVICE



Department of Biodiversity, Conservation and Attractions

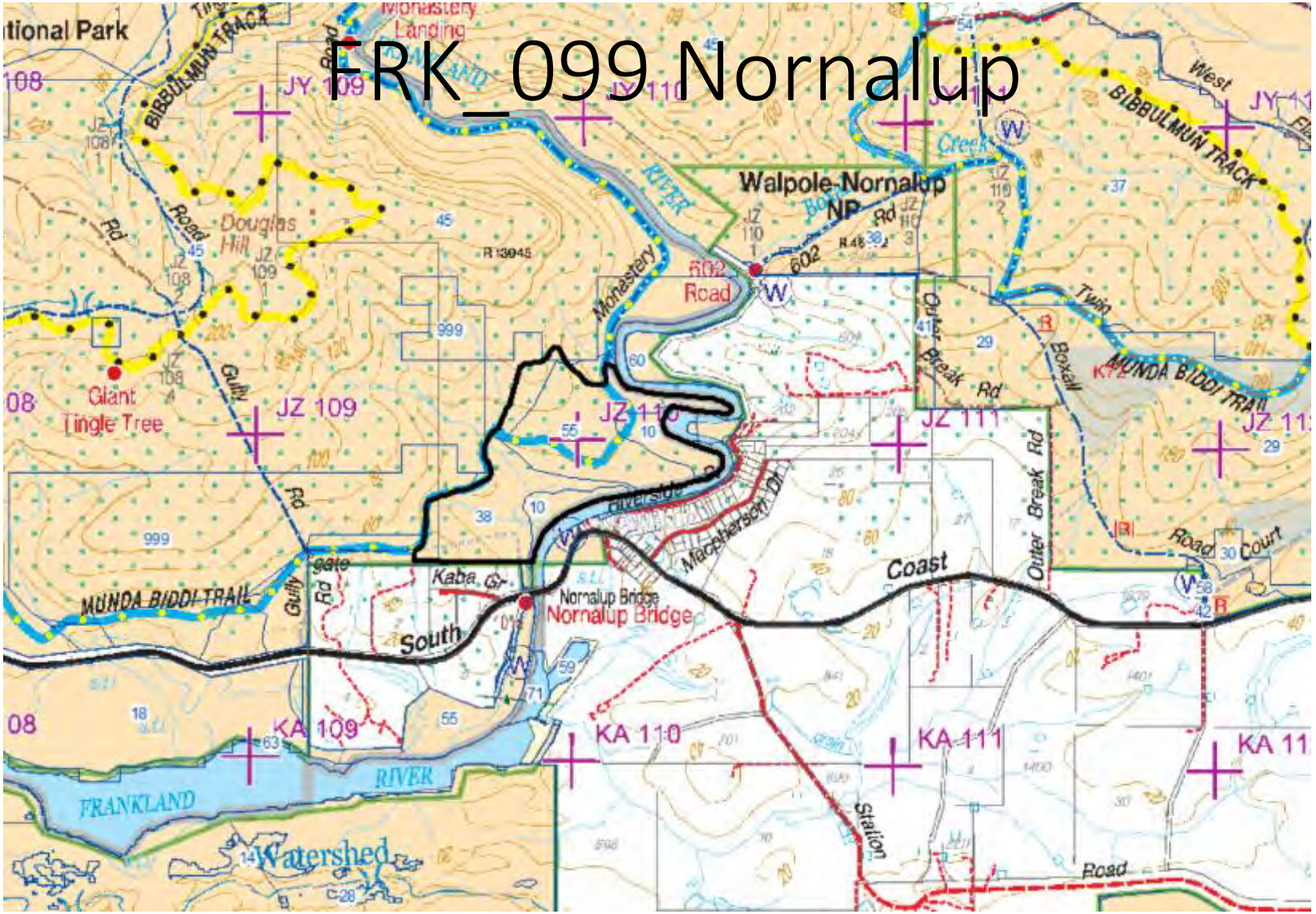
PARKS AND WILDLIFE SERVICE

DON_106 Dombakup



Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE



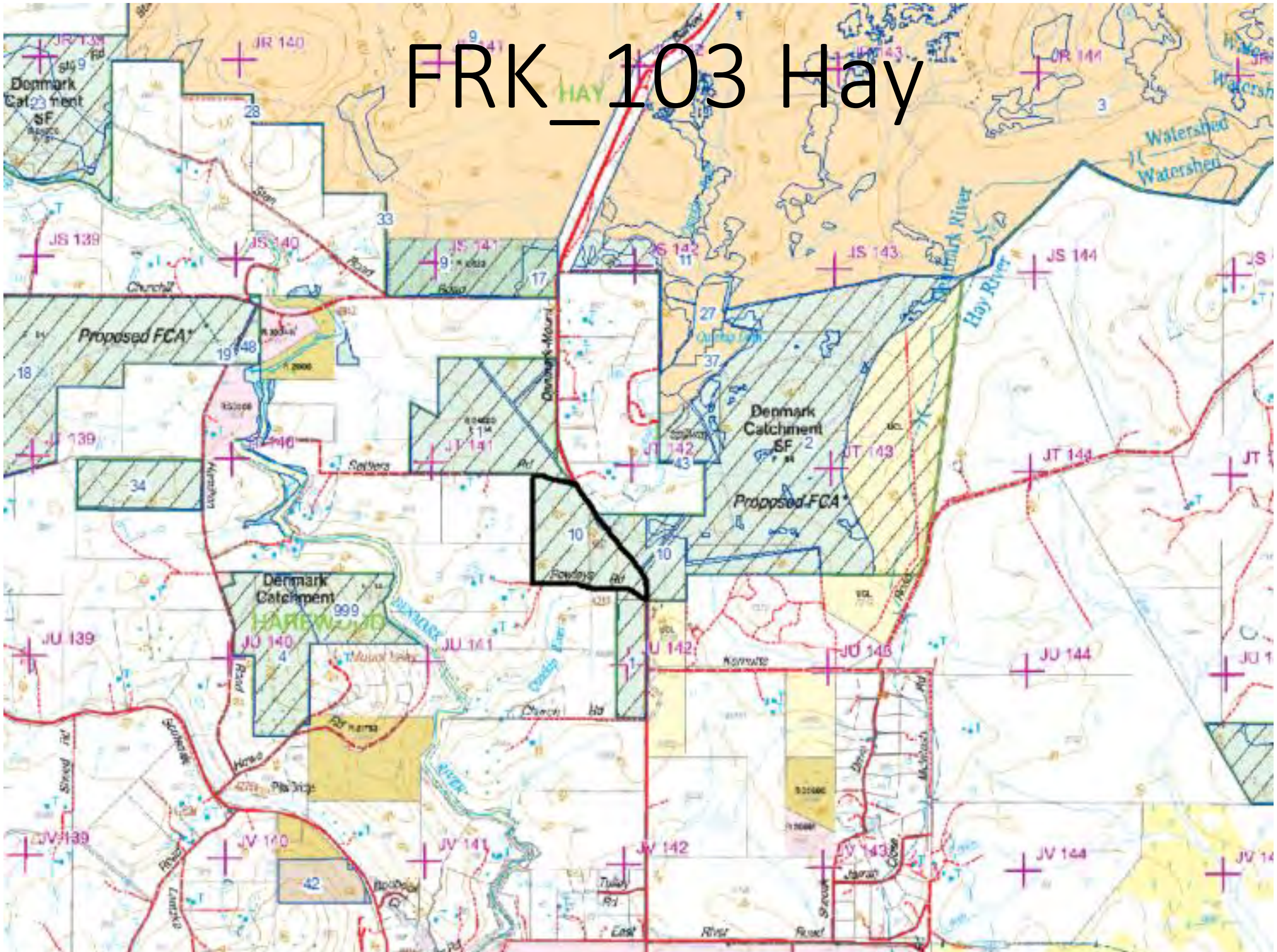
Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

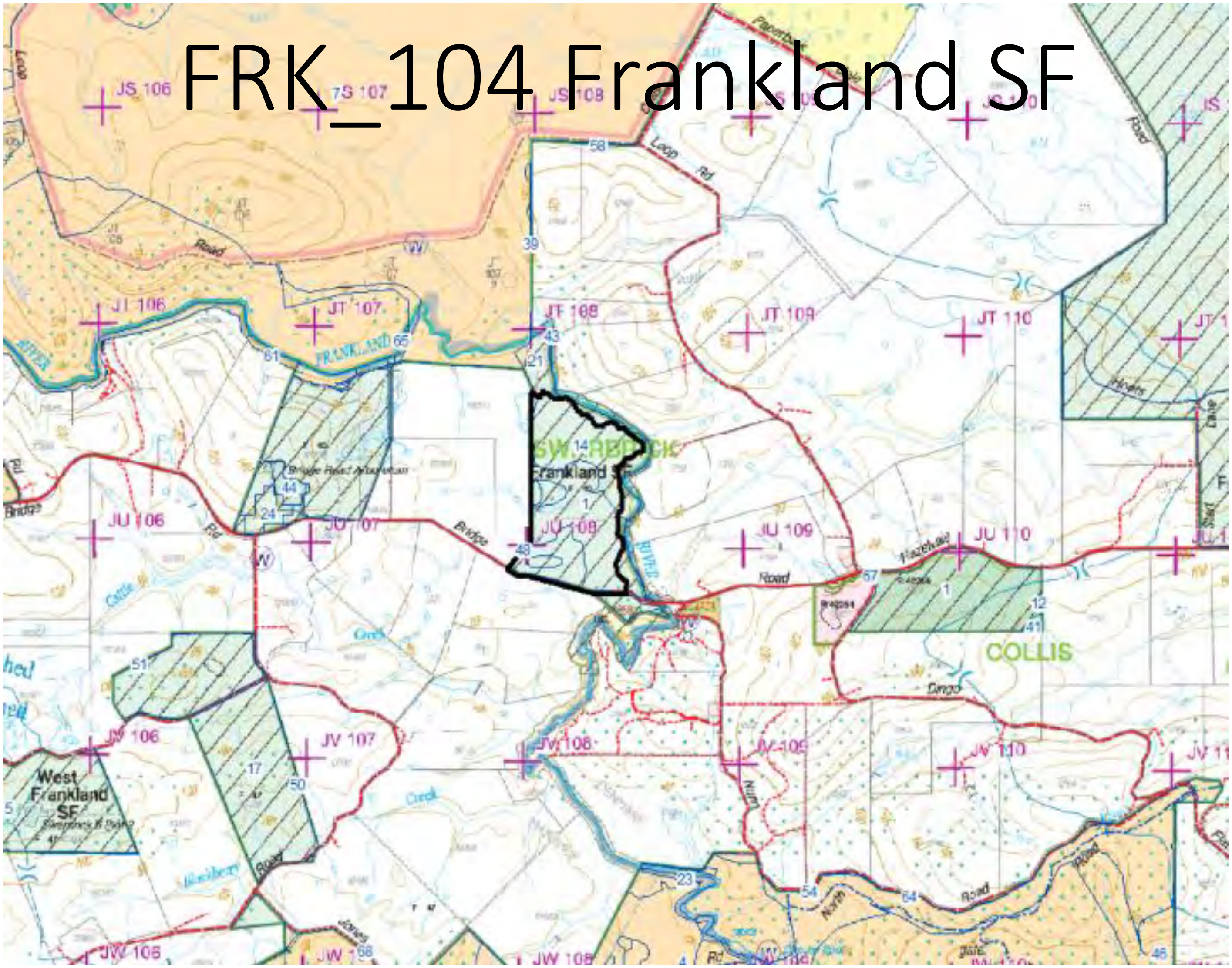
Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

FRK_103 Hay



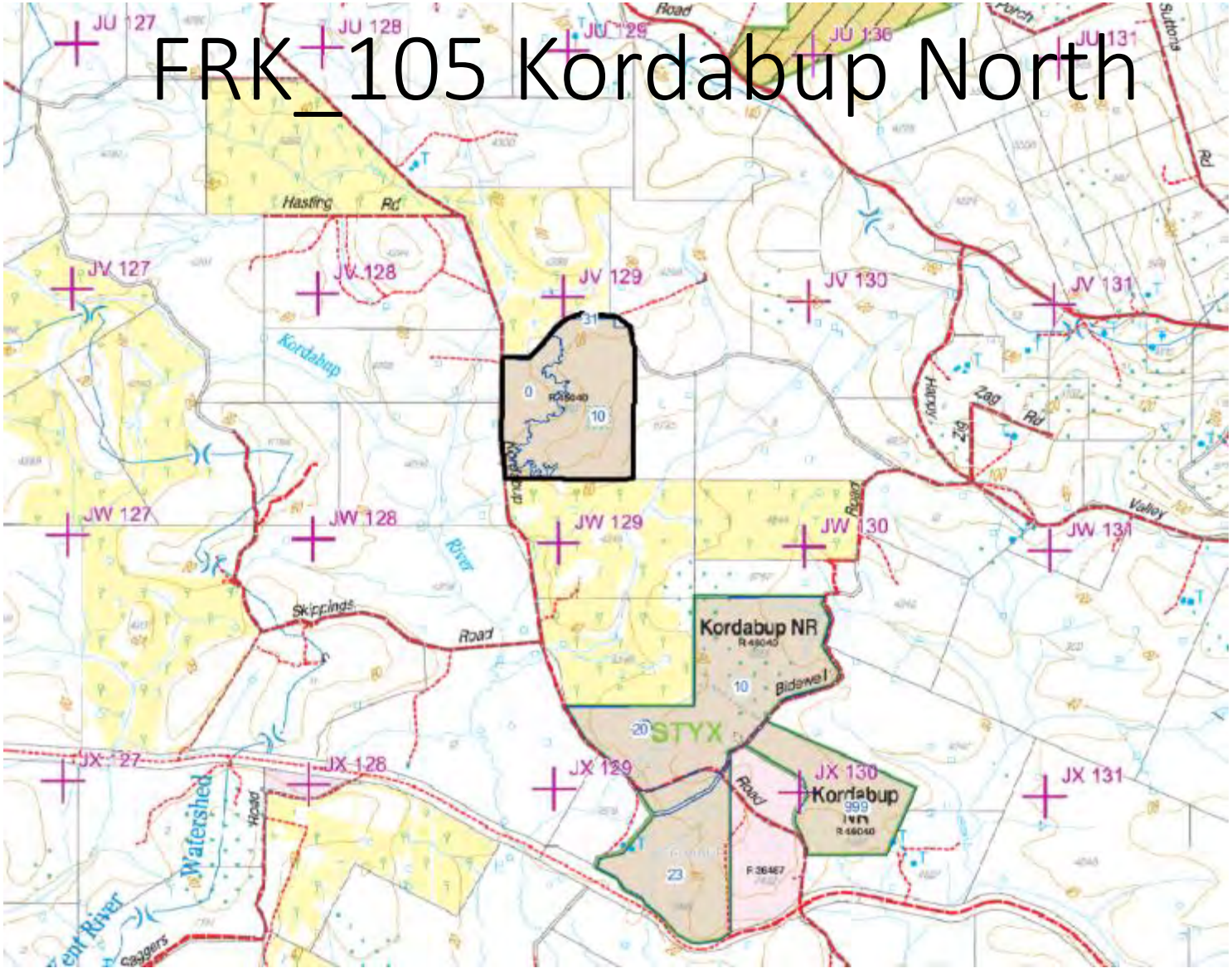
FRK_104 Frankland SF



Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

FRK_105 Kordabup North



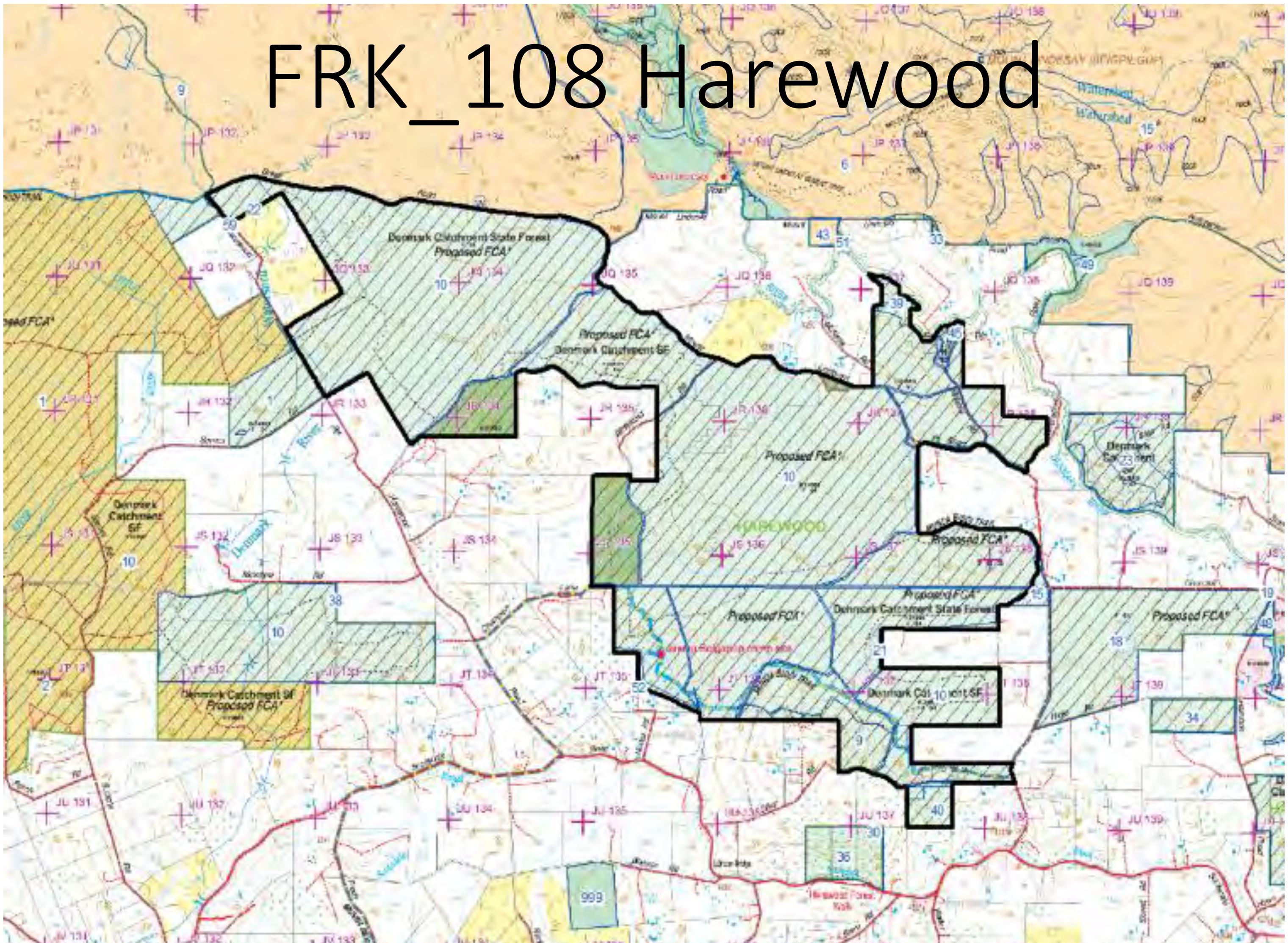
Slide 98: Stakeholder presentation - Burn Options Program
Walpole 11 June 2025

GOVERNMENT OF WESTERN AUSTRALIA

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

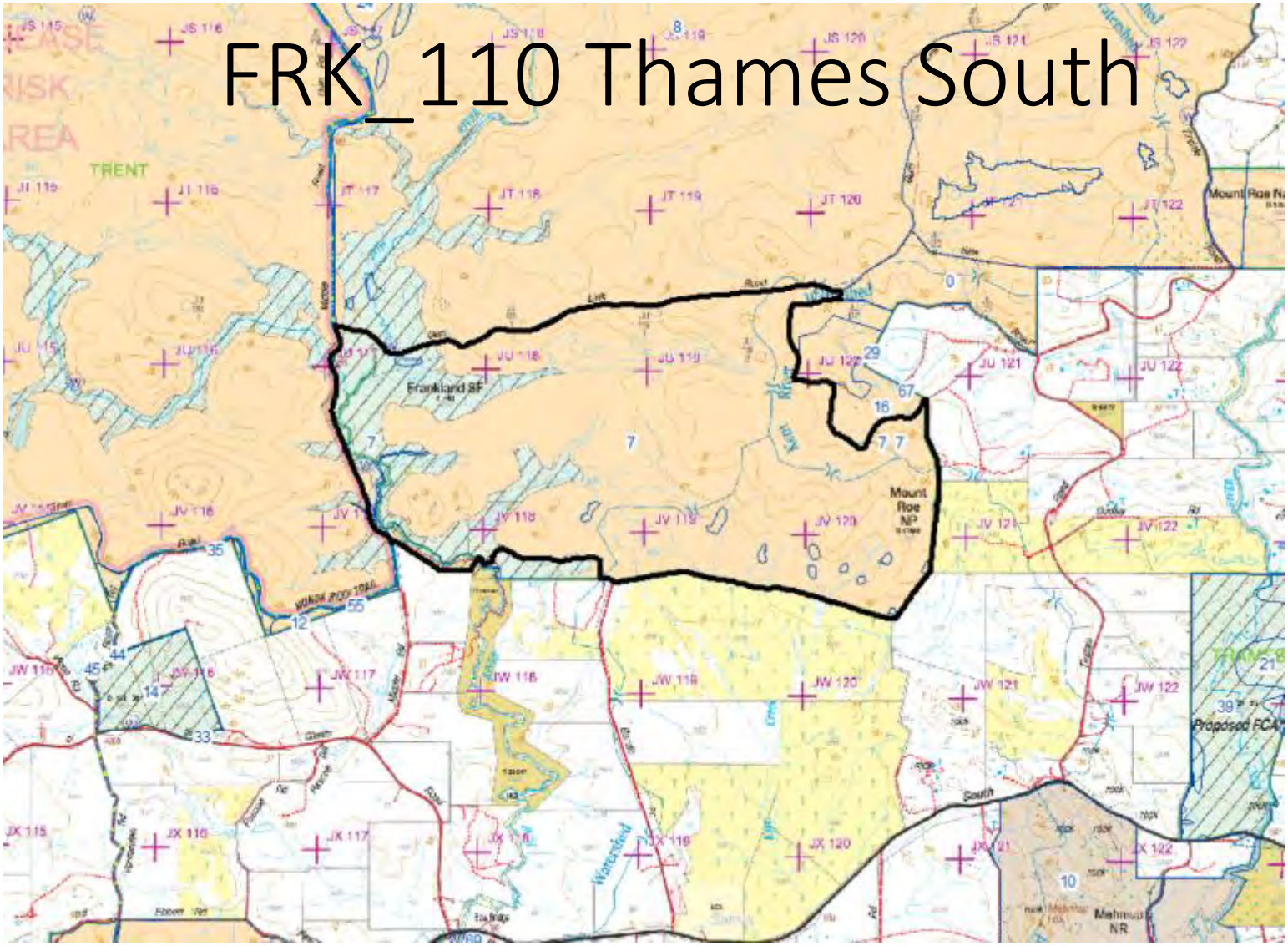
FRK_108 Harewood



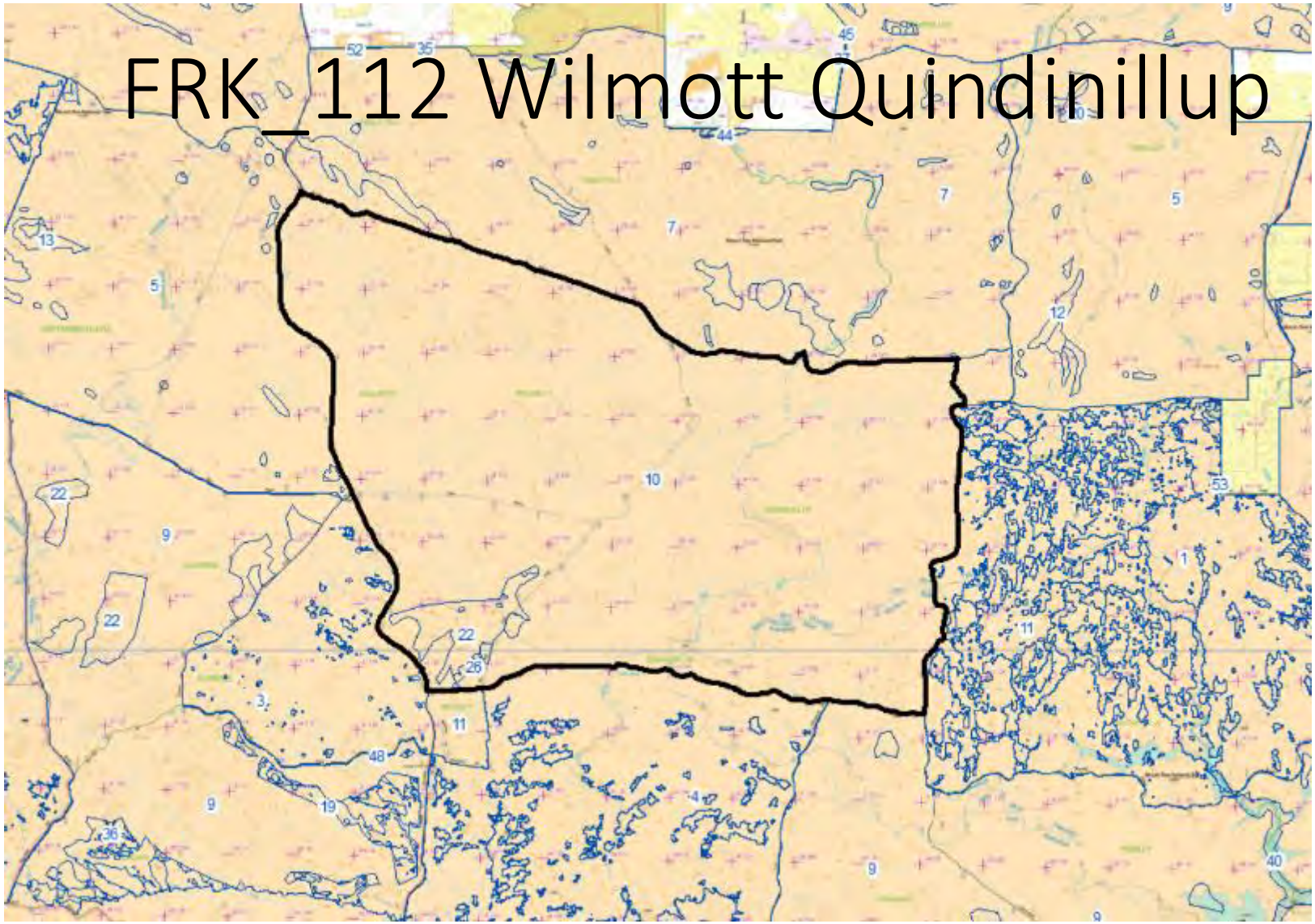
Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

FRK_110 Thames South



FRK_112 Wilmott Quindinillup

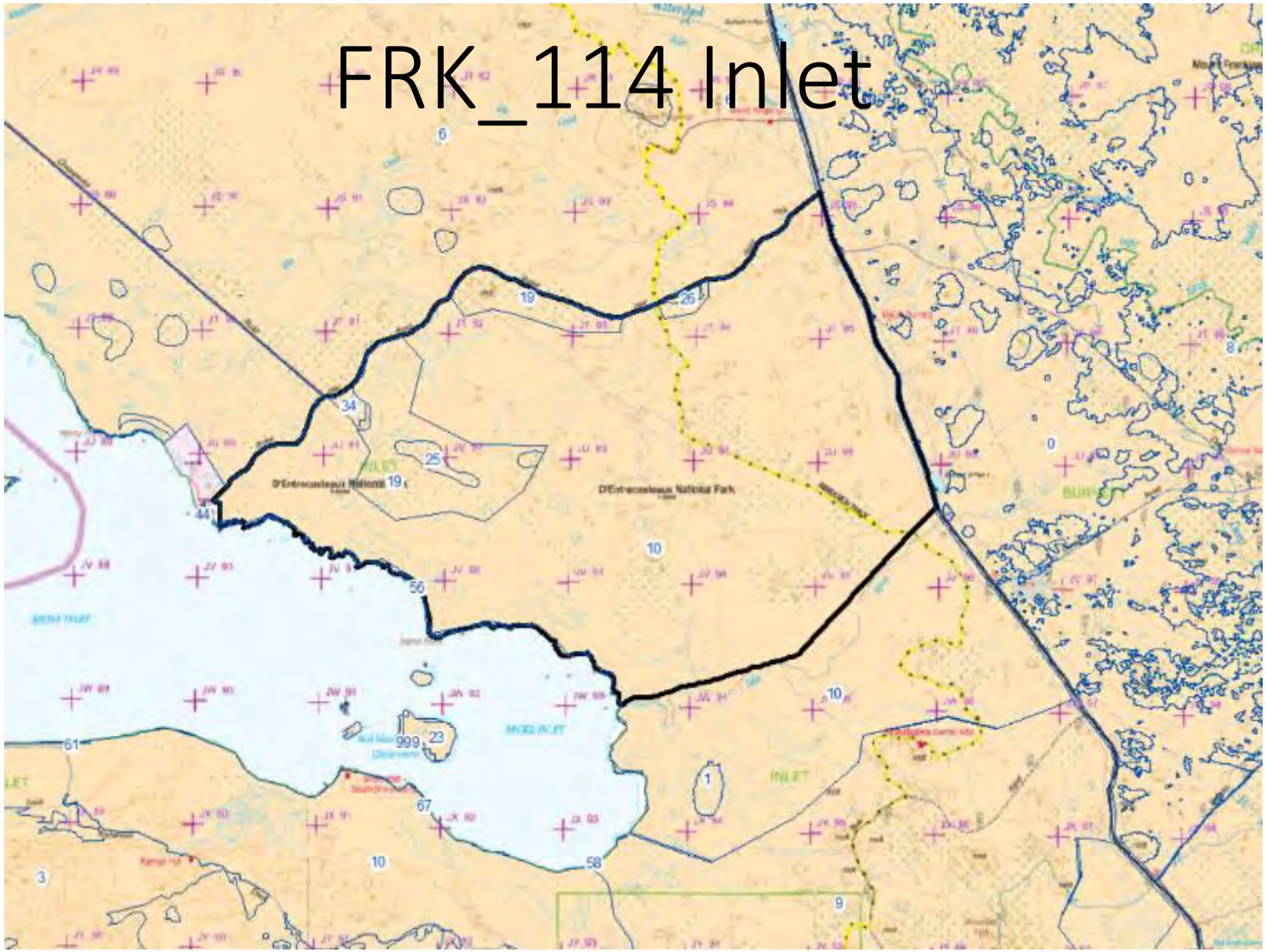


Department of Biodiversity, Conservation and Attractions

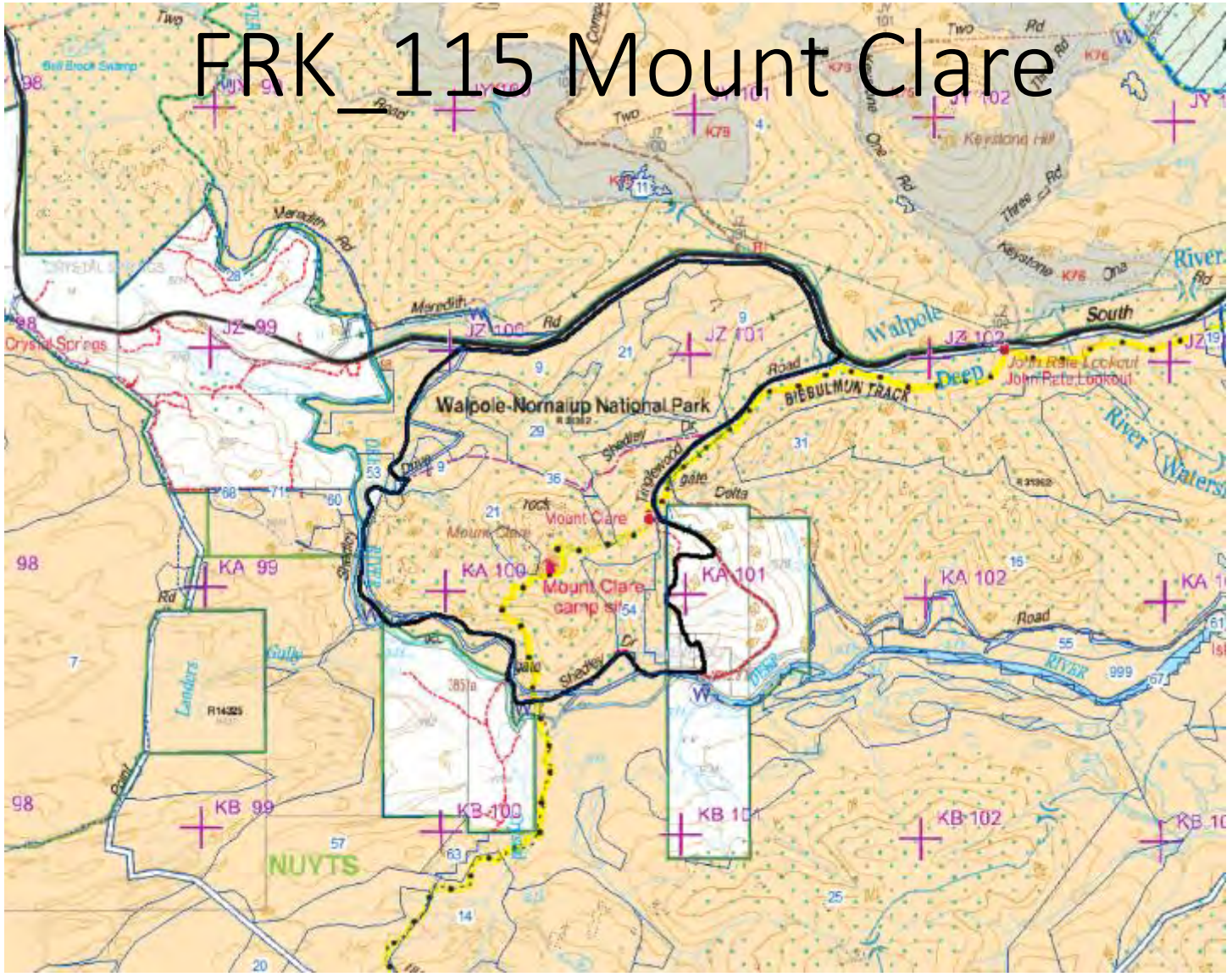
PARKS AND WILDLIFE SERVICE

FRK_113 Coalmine

FRK_114 Inlet



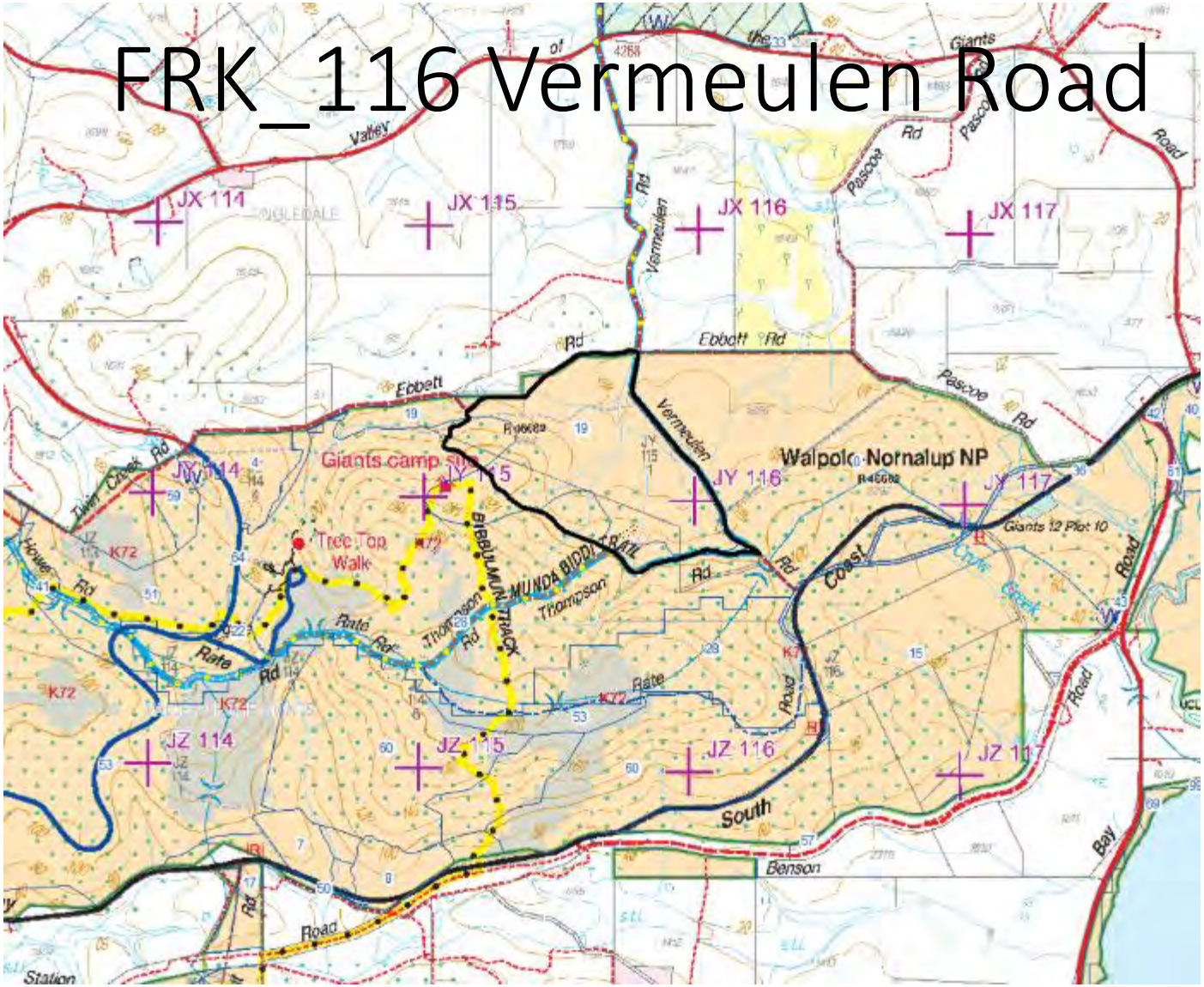
FRK_115 Mount Clare



Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

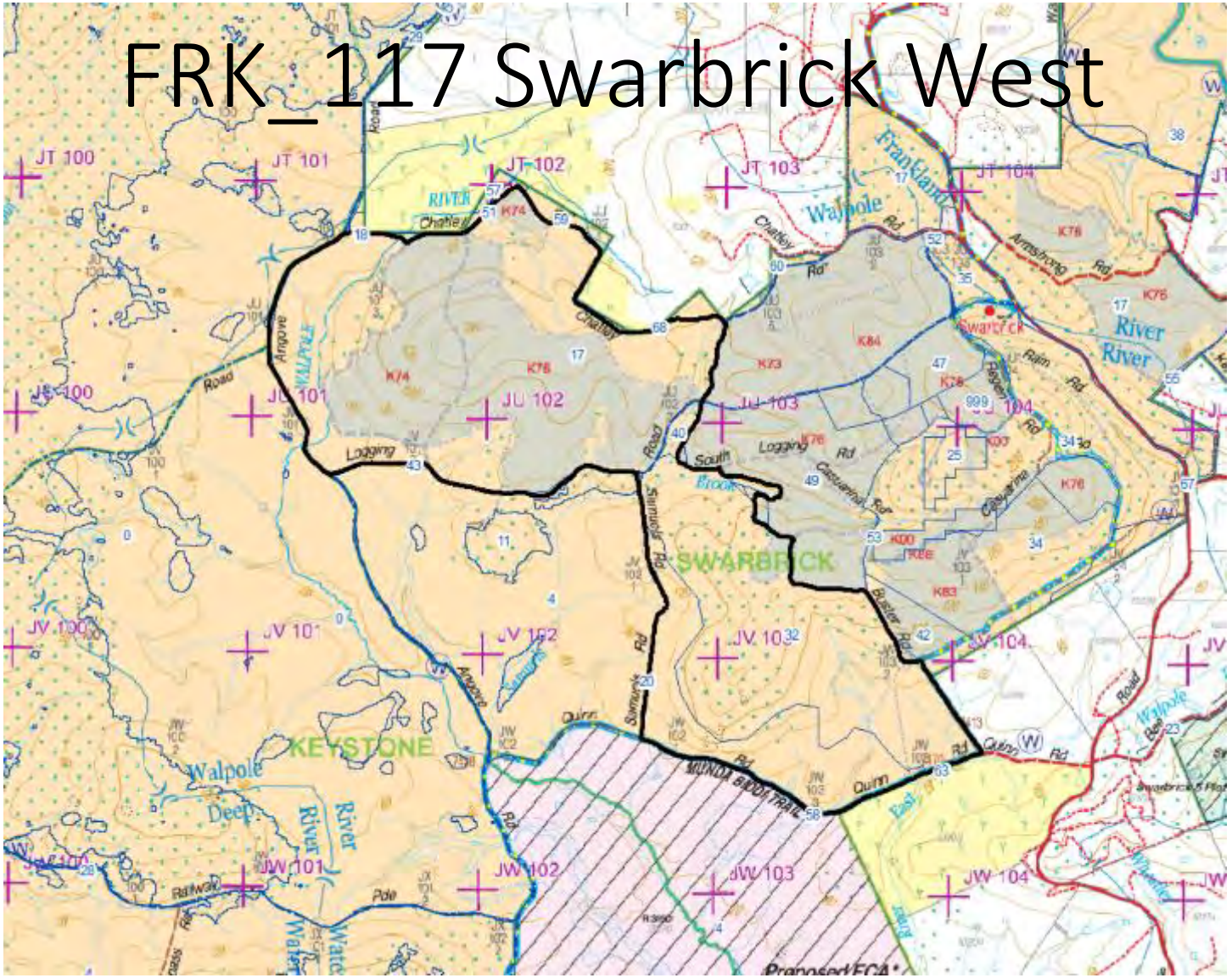
FRK_116 Vermeulen Road



Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

FRK_117 Swarbrick West

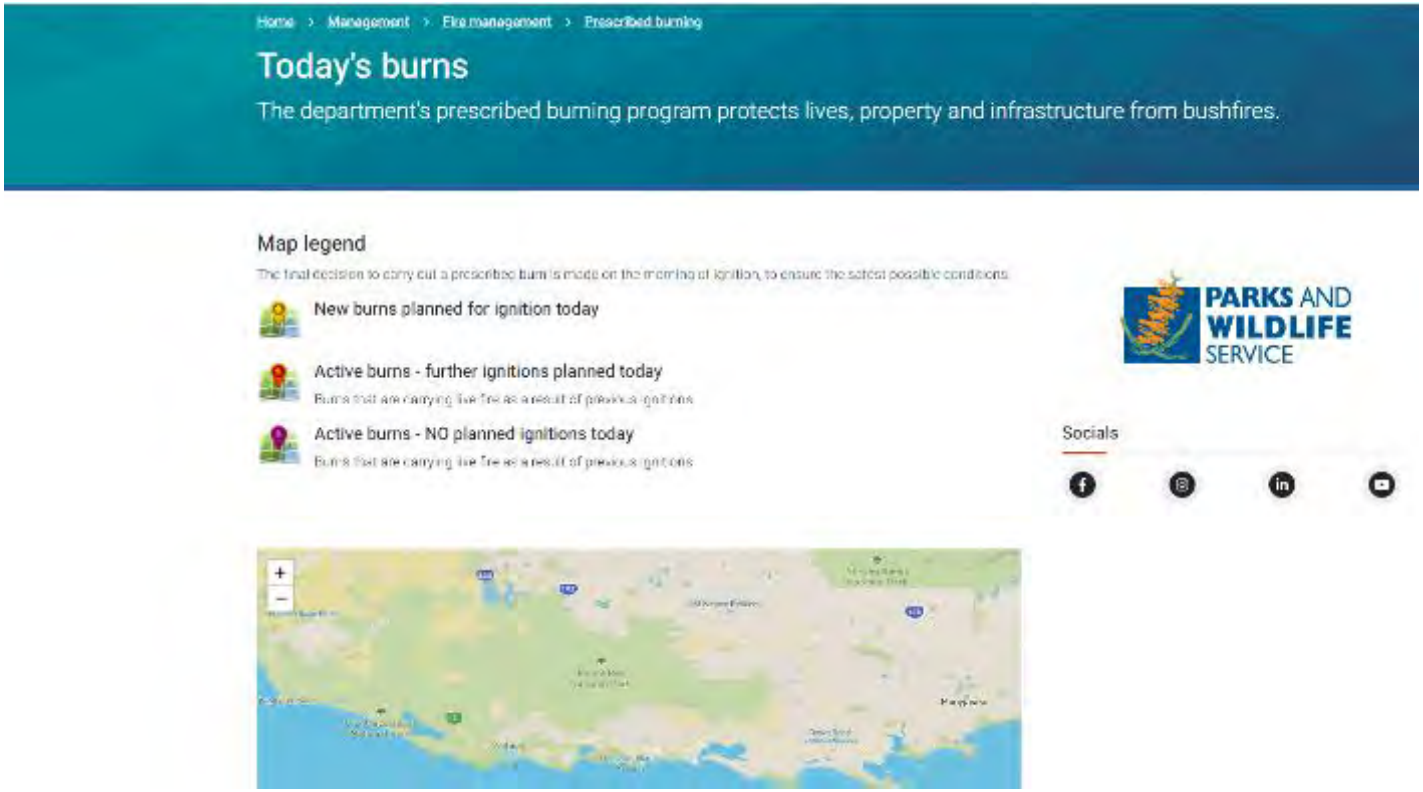


Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Parks and Wildlife Service – Burn Information

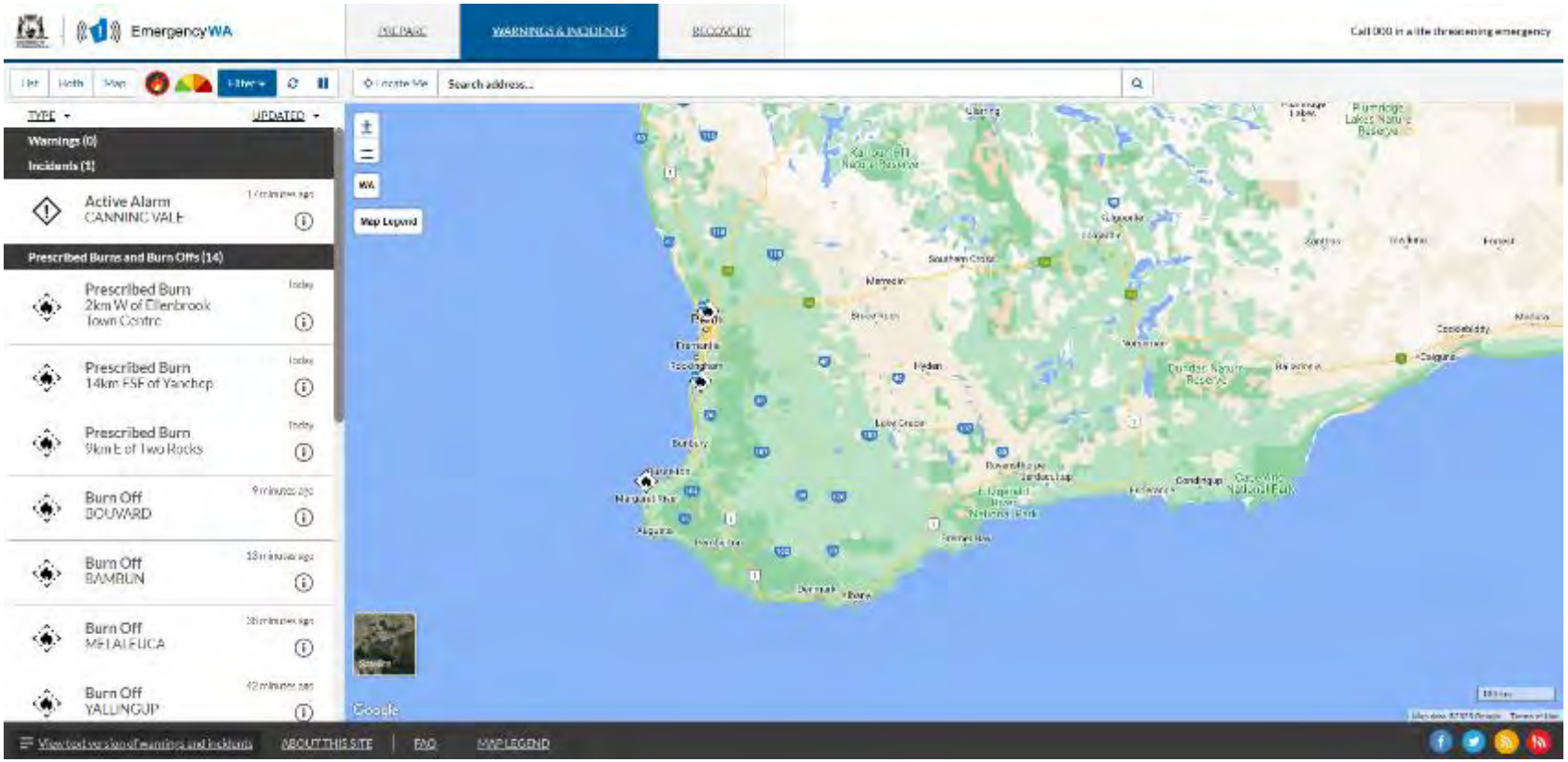
www.dbca.wa.gov.au/todaysburns



Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

www.emergency.wa.gov.au



Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

To find out more…

DBCA Frankland District (Walpole)

9840 0400

Frankland.District@dbca.wa.gov.au

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

DBCA's Fire Detection and Rapid Response

2025

Timely detection and response

Science and experience based:

- VESTA – 150m fire length required to realise maximum potential ROS.
- >45 minutes = ~double chance of >10ha.
- Multilateral Aggressive Initial Attack increases success likelihood.
- Timely detection is essential.

Slide 111: Stakeholder presentation – Detection and response
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Fire Management Services

AIRCRAFT FACT SHEET

Fire Surveillance/Air Attack and Reconnaissance

American Champion Scout

Aircraft Length	7m
Wing Span	11m
Engine(s)	Single, 6 litre 4 cylinder, 180 HP
Fuel Type	Avgas
Fuel Consumption	33 litres per hour
Cruise Speed	110 knots
Endurance	5 hours
Use	High wing light aircraft for fire surveillance, reconnaissance and air attack
Aircrew	Pilot +1 (in tandem)
Base Location	Bunbury, Manjimup and Dwellingup
Date	April 2011

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Combined fire detection south-west

- 5 spotter circuits
- 9 Detection Towers
- DFES ‘000’ notifications

Remote sensing

- Satellite detection
- Detection cameras

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Aggressive Initial Attack

9. FIRE SUPPRESSION

9.1. DESPATCH TABLES

Shows size of fire fighting forces and equipment to be despatched for suppression of fires in Northern Jarrah, Southern Forest and Pine fuels. Size depends on time to reach the fire and level of fire behaviour.

9.1.1. Northern Jarrah

Fire Danger Index	Time between detection and attack															
	½ hour				1 hour				1½ hours				2 hours			
	G	HD	WL	BD	G	HD	WL	BD	G	HD	WL	BD	G	HD	WL	BD
0-40	1	1	0	0	2	1	1	1	2	2	1	1	3	2	2	2
41-60	2	2	1	1	2	2	1	1	3	2	1	1	3	3	2	2
61-140	2	2	1	1	3	3	1	1	4	4	2	2	4	4	3	3
141-240	3	3	2	1	3	3	2	2	4	4	3	3	5	5	4	4
241-400	4	3	3	2	5	5	3	3	6	6	4	4	7	7	5	5
400+	4	4	3	3	6	6	4	4	7	7	5	5	8	8	6	6

G Gang
HD Heavy Duty
WL Wheeled Loader
BD Bulldozer

9.1.2. Southern Forest

Fire Danger Index	Time between detection and attack															
	½ hour				1 hour				1½ hours				2 hours			
	G	HD	WL	BD	G	HD	WL	BD	G	HD	WL	BD	G	HD	WL	BD
0-40	1	1	1	0	2	1	1	1	2	2	1	1	3	2	2	2
41-60	2	1	1	1	2	2	1	1	3	2	2	2	4	3	2	3
61-140	3	2	1	1	3	3	1	1	4	4	2	3	5	5	3	4
141-240	3	3	2	1	3	4	2	2	4	5	3	4	6	6	3	5
241-400	4	3	3	2	5	6	3	3	6	7	4	5	7	7	4	7
400+	4	4	3	3	6	6	3	4	7	7	5	5	8	8	4	7

G Gang
HD Heavy Duty
WL Wheeled Loader
BD Bulldozer

Slide 116: Stakeholder presentation – Detection and response
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions
PARKS AND WILDLIFE SERVICE

Department of Fire and Emergency Services
Department of Biodiversity, Conservation and Attractions

Fire & Emergency Aviation Fleet 2025-26

Correct as at 01 May 2025

Department of Fire & Emergency Services (DFES)

YEAR-ROUND SERVICES

All Hazards Rescue / Aerial Intelligence Surveillance & Reconnaissance (AISR)

All Hazards Rescue Aeromedical → 24/7 Year-Round
Jandakot
RSCU 651
Leonardo AW139

Bunbury
RSCU 652
Leonardo AW139

Technical Backup
RSCU 553
Leonardo AW139

Utility / Tactical AISR
Jandakot Nov → 306 days
FIREBIRD 661
AS365 Dauphin

Strategic AISR– Line Scanner
Jandakot Nov → Sep
FIRESCAN 125
King Air B200

SEASONAL TERM - CONTRACT SERVICES

Air Attack Supervision

Jandakot Nov → Apr
FIREBIRD 623
AS355 Twin Squirrel

FIREBIRD 662
AS365 Dauphin

Fire Bombing Aircraft

Jandakot Nov → Apr
Jandakot Dec → Apr
Busselton Dec → Mar
Serpentine Nov → Mar
Gingin Dec → Mar

HELITAK – Type 2 Bell 214 (2,650 Litres)
HELITAK – Type 1 UH60 Blackhawk (4,500 Litres)

Busselton Dec → Feb
BIRDDOG 125
Gulfstream Turbo Commander

BOMBER 132
Large Air Tanker (LAT) C-130 (15,141 Litres)

Department of Biodiversity Conservations & Attractions (DBCA)

Fire Detection Surveillance Patrol Program

Fire Surveillance / Air Observation
Perth Hills
Wellington
Blackwood
Donnelly
Frankland
FIRE SPOTTER
American Champion 8GCBC Scout

Aerial Ignition / Remote Sensing
BIRDDOG
Kodiak Quest

Air Attack Supervision

Jandakot
FIREBIRD
AS350 Squirrel

Jandakot
BIRDDOG
C-182

Bunbury
FIREBIRD
AS350 Squirrel

Manjimup
BIRDDOG

Albany
BIRDDOG
8GCBC Scout

Fire Bombing Aircraft

98+ Days – activated based on risk
Jandakot
Bunbury
Manjimup
Albany

BOMBER – Single Engine Air Tanker (SEAT) AT-802 (3,150 Litres)

Multi-Mission
AS350 Squirrel

Slide 117: Stakeholder presentation – Detection and response
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Slide 118: Stakeholder presentation – Detection and response
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Slide 119: Stakeholder presentation – Detection and response
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

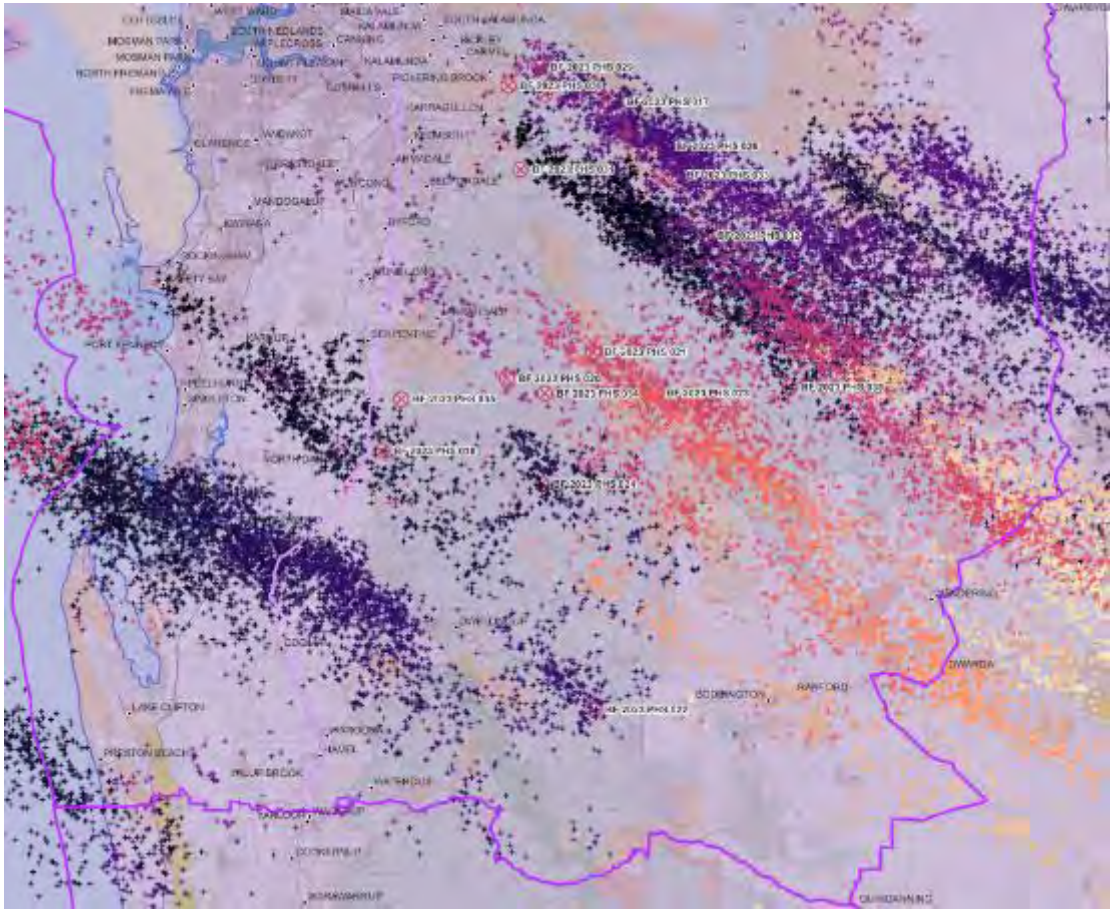

N8286

Department of Biodiversity, Conservation and Attractions

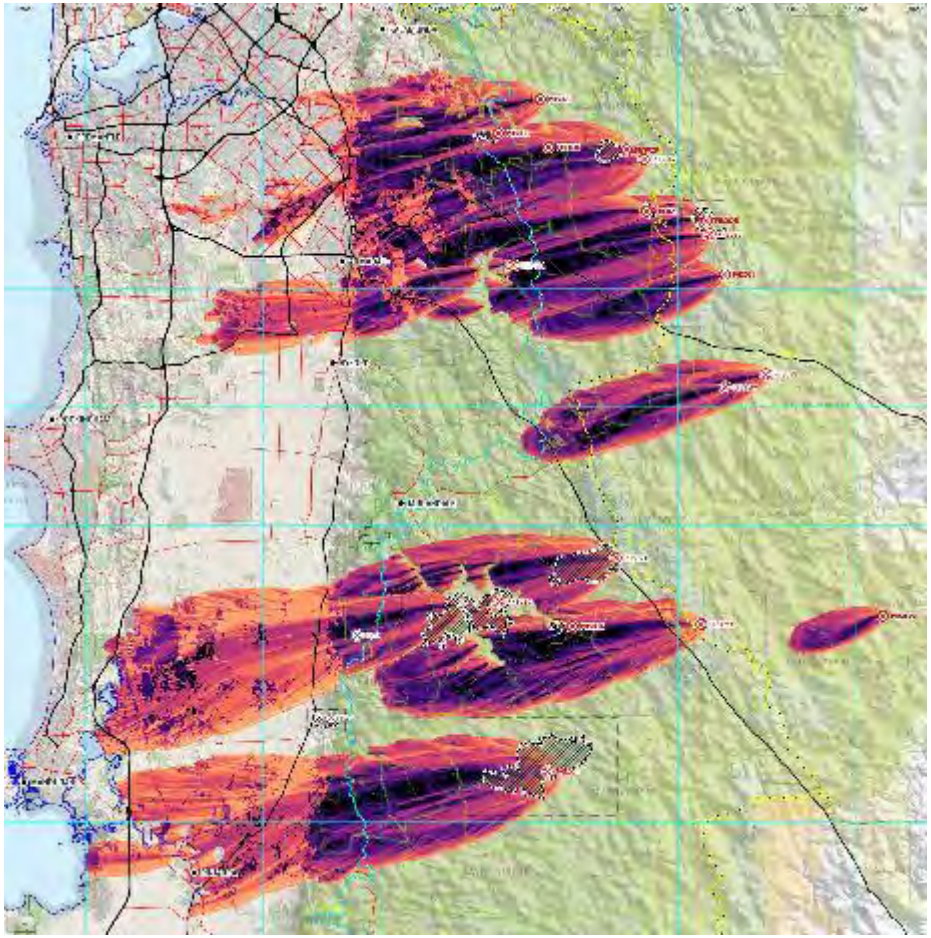
PARKS AND WILDLIFE SERVICE

Lightning strikes 4/11/23

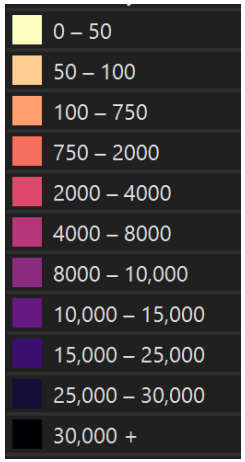
- Hundreds of strikes across Perth Hills in the early hours of Saturday morning
- No significant rainfall
- Elevated Fire Weather Conditions



What if the fuels were older?



- Conservative modelling for 16hrs in 30+yo fuels
- About 165,000ha in 16hrs
- About 56% of fire area above 4000kw/hr
- Does not account for fires merging, Pyro Cb or long-range spotting



Intensity Mapping Simulation

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Managing biodiversity in fire management

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Fire has been present in the Western Australian landscape for millions of years – since long before the arrival of humans – and it has influenced the evolution of plants and animals.

Since the arrival of the first nations people fire has been used as a tool for managing vegetation and hunting/gathering.

DBCA recognises the importance of the south-west as a global biodiversity hotspot and is committed to protecting and promoting the health of the landscape for future generations.

Prescribed Burn Options Program planning

- DBCA holds various legislative responsibilities for managing its tenure
- Competing responsibilities often arise, increasing management complexity
- Landscapes can be highly complex with numerous values and specific fire regime requirements
- Districts and Regions must consider all aspects of land management when developing a burn program
- Where conflicting objectives exist, a consultative process is undertaken to align these objectives where possible

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Strategic approach to prescribed burning

Careful planning, consultation, and monitoring to minimis impacts on environmental values and the community.

Key Considerations:

- **Vegetation assessment -** Identify what to burn and wh leave unburnt (mosaic approach)
- **Burn characteristics -** Define desired fire intensity and optimal season
- **Fire history -** Consider history and type of past fire ever across the landscape
- **Fuel assessment and analysis -** Measure fuel quantity arrangement, and moisture content
- **Knowledge and tools -** Determining, monitoring and forecasting the appropriate weather conditions for ignit a burn using specialist knowledge and fire behaviour models and tables
- **Ignition strategy -** Choose the best time of day and igni pattern to complete the burn safely and effectively
- **Continuous improvement -** Apply lessons learned to enhance future operations

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Legislation and Policy – Environmental considerations

Detailed planning is undertaken for each prescribed burn as part of our obligations under the:

- *Conservation and Land Management Act 1984*
- *Biodiversity Conservation Act 2016*
- *Environment Protection and Biodiversity Conservation Act 1999*
- Corporate Policy Statement 19 – Fire Management
  - Minimise negative impacts on communities and the natural environment from bushfires on lands managed by the department.
- Corporate Policy State 88 – Prescribed Burning
  - Apply prescribed burning activities in the areas where they contribute the most effective mitigation of bushfire risk; and contribute to the management of conservation, biodiversity and Aboriginal cultural heritage values.

Identifying ecological values within the burn area

To confirm the likelihood of threatened species and ecological community occurrence within the prescribed burn area, DBCA uses various information sources:

- Commonwealth Protected Matters Search Tool – *provides baseline data to begin assessment*
- DBCA Threatened Species and Ecological Communities Database - *accurate, up-to-date presence data*
- Subject Matter Expert Advice - *insights from local experienced experts*
- Reliable Observations - *verified local sightings and records*
- Surveys - *targeted field assessments*

Ecological considerations and risk assessment for each prescribed fire plan

Risk-assessment:

- Assess the significance of likely impacts on species and ecological communities from prescribed burns
- Consider cumulative impacts on species and ecological communities
- Consider impacts to areas within or adjacent to the burn
- Identify management actions to reduce potential harm

Key resources used:

- MNES Significant Impact Criteria
- DBCAs Fire Management Information Notes
- Conservation Advice
- Recovery Plans
- Threat Abatement Plans
- Species Profiles and Threats Database (SPRAT)
- Other relevant departmental, state, and federal publications

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Implementing key measures to protect biodiversity values

Key Measures:

- Clearly define mitigation activities / management actions and avoidance strategies
  - Pre-burn – raking around trees, use of foam or retardant
  - Day of burn – burn exclusion areas, careful ignition strategies to manage fire behaviour
  - Post burn – monitor and review post burn recovery

Implementation:

- Communicated to operational staff during briefings
- Actively applied during on-ground fire management operations
- Contingency plans

Pre-burn monitoring

Informs safe, effective and ecologically responsible prescribed burns:

- Surveys in known threatened species occurrence areas
  - Confirm presence and inform protection measures
- Monitoring of organic soil/peat systems
  - Ensure adequate saturation to prevent extensive substrate loss
- Assessing profile soil moisture and leaf litter moisture content
  - Verify conditions are suitable for ignition prior to prescribed burn implementation

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Day of burn actions: minimising biodiversity impacts

- Implement the prescribed burn with precision and care to ensure biodiversity values are protected.
- Apply planned mitigation measures – based on pre-burn assessments and ecological priorities
- Control ignition patterns and timing
- Ensure all staff are briefed and understand biodiversity protection management actions
- Document actions and observations.

Post burn monitoring and adaptive management

Post-burn monitoring:

- Evaluates burn success criteria
- Informs and refines future burn operations

Adaptive management approach:

- Adjust fire regimes and burning strategies as needed
  - Respond to changing climatic conditions
- Apply lessons learned
  - Use past experience to refine future strategies
- Use monitoring outcomes
  - Guide continuous improvement through evidence-based decisions

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Observations from the Warren Region

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Quokka

Setonix brachyurus

Legislation:

Listed as vulnerable (VU) under BC Act & EPBC Act.

Management directed by:

FMIN, current research and Interim Recovery Plan

Pre and post burn/bushfire monitoring:

- Remote sensor camera monitoring for restricted habitat areas (Northern Jarrah).
- Landscape monitoring for contiguous habitat & distribution (e.g. scat counts).

Remote camera image of quokka

Other observations:

O'Sullivan Bushfire 2015:

- 98,000 hectares burnt
- 70%+ population loss
- 1 year post bushfire average 500m movement from fire edge into fire

Keystone Prescribed Burn:

- 4,459 hectares treated
- 1 year post fire average 2km movement from burn edge

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Western Ringtail Possum, Ngwayir

Pseudocheirus occidentalis

Legislation:

Listed as critically endangered (CR) under BC Act & EPBC Act.

Management directed by:

FMIN, current research and expert advice and Interim Recovery Plan

Pre and post burn/bushfire monitoring:

- Remote sensor camera monitoring as part of other threatened fauna projects
- Ongoing spotlighting surveys

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Sunset Frog

Spicospina flammocaerulea

Legislation:

Listed as vulnerable (VU) under BC Act & EPBC Act.

Management directed by:

FMIN, current research and Interim Recovery Plan

Pre and post burn/bushfire monitoring:

- Calling surveys pre and post burn.
- Moisture thresholds checked pre-burn.
- Data collected appears to indicate a level of fire introduction potentially induces breeding behaviour in some populations.
- Appear to be relatively fire resilient, calling monitored after severe habitat damage.

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Observations: Fire damage – Middle Road Fire

- Calling in one population at the greatest numbers in sixteen years one week post fire (population was not calling two weeks prior to the fire).
- Continued similar calling for the year following the fire.
- Collaborative research project between DBCA and UWA includes investigating fire response.

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

P4

Tingle Forest – Red, Rates & Yellow

Legislation:

Rates Tingle (Priority 4)

Management directed by:

FMIN, current research, past historical data and Interim Recovery Plan

Guidance from Tingle Forest FMIN based on research including: 'Trial Tingle Burn' by Mair, Tillman & Troeth

Pre and post burn/bushfire monitoring:

- Veteran Tingle project since 2019.
- Severity mapping.
- Post burn tingle tree survey.

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Giants East Prescribed Burn

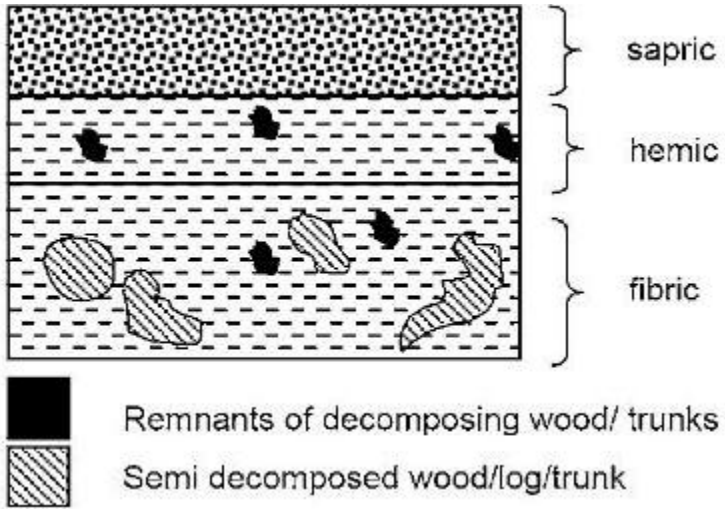
- Burn area surveyed for fallen Tingle tree locations and condition (e.g. evidence of epicormic growth).
- Burn severity mapping for 2024 will be used for comparison with previous two prescribed burns.
- Contributing factors include fuel loads, time since last burnt, use of access tracks & ignition timing.

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Peat – an overview

- There are 3 main types of peat based on the degree of decomposition & fiber content:
  - Sapric – most decomposed (dark brown/black)
  - Hemic – partially decomposed (dark brown)
  - Fibric – least decomposed (golden brown)



- "True" peats are those with a significant organic content of which a high proportion is carbon.
- Perched wetland peats and peat lakes can occur in isolation but other systems can transpose into an organic soil substrate (more sand content). The difference can be subtle.
- Frankland peats are a combination of perched wetland systems, low profile wetland systems and lakes.

Peats

- Peat systems rely on recharge to retain decomposition levels
- Peat lakes fill with water
- Peatlands become saturated
- If they do not fully recharge the peat systems will dry more rapidly through Spring and Summer
- Full recharge usually occurs around late August

Burning and peats

- Measurement by portable soil moisture meter and squeeze test
- Cross section of known or identified peats
- Current guidance for moisture threshold of >12% in top layer of peat.
- Residence time vs intensity decisions

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

BCS Fire Science Program

Manjimup and Walpole community information forum June 2025

Program lead

Ben Miller: plant ecology, fire regimes

+ 6 Scientists (Manjimup and Kings Park)

plant ecology, fire behaviour, fuels, fauna ecology, fire regimes, fire severity, mosaics,
FMP, fire severity/fire regimes and Pilbara projects

+ 6-10 Technical officers

+ 3-5 PhD students

~45 peer reviewed papers published 2024 + 2025 to date. Including:

1. Brace et al. (2025) Herbicide, not prescribed burning, drives larger shifts in soil fungal communities in a Mediterranean-type urban woodland. *Urban Forestry & Urban Greening*
2. Garcia-Carmona et al. (2025) Pyrogenic carbon production in eucalypt forests. *Forest Ecology and Management* (*FEM*)
3. Gibson et al (2025) Remotely sensed fire heterogeneity and biomass recovery predicts empirical biodiversity responses. *Global Ecology and Biogeography*
4. Hollis et al. (2025) An efficient and comprehensive field protocol for assessing fuel characteristics for fire behaviour modelling in Australian open forests. *MethodsX*
5. Miller et al. (2025) Using patterns of post-fire plant reproduction to inform minimum fire intervals for conservation management in a fire-prone woodland. *Austral Ecology*
6. Sano et al. (2025) Extreme fire severity interacts with seed traits to moderate post-fire species. *American Journal of Botany*
7. Tangney et al. (2025) Defining the pyro-thermal niche: Do seed traits, ecosystem type and phylogeny influence thermal thresholds in seeds with physical dormancy? *New Phytologist*
8. Brace et al. (2024) Short-term soil fungal community dynamics following fire in mediterranean climate-type banksia woodlands. *Soil Biology and Biochemistry*
9. Davis and Craig (2024) Long-term post-fire succession of reptiles in an urban remnant in south-western Australia. *Int J Wildland Fire* (*IJWF*)
10. Doherty et al. (2024) Multi-year responses of reptiles to prescribed burning in a eucalypt forest ecosystem. *Austral Ecology*
11. Doherty et al. (2024) Shifting fire regimes cause continent-wide transformation of threatened species habitat. *PNAS*
12. Hollis et al. (2024) A framework for defining fire danger to support fire management operations in Australia. *IJWF*
13. Hollis et al. (2024) Introduction to the Australian Fire Danger Rating System. *IJWF*
14. Kenny et al. (2024) Australian Fire Danger Rating System: implementing fire behaviour calculations. *IJWF*
15. Miller et al. (2024) Plant life history data as evidence of an historical mixed-severity fire regime in Banksia woodlands. *Australian J of Botany*
16. Miller et al. (2024) Comment on 'Self-thinning forest understoreys reduce wildfire risk, even in a warming climate'. *Environmental Research Letters*
17. Nolan et al. (2024) Incorporating burn heterogeneity with fuel load estimates may improve fire behaviour predictions. *IJWF*
18. Overton et al. (2024) Some like it hot: Seed thermal threshold variation in obligate seeding *Acacia pulchella*. *Science of the Total Environment*
19. Radford et al. (2024) Prescribed burning beneficial or neutral for native herbaceous vegetation in an invader dominated, commercially grazed savanna. *Austral Ecology*
20. Woolley et al. (2024) Nestbox use indicates declining arboreal mammals in an Australian savanna may be limited by tree hollow availability. *FEM*

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Understanding fuel dynamics

- Improving field assessment methods for fuel characterisation
- Improving Jarrah forest fuel accumulation models, accounting for time since fire, fire severity and forest type
- Developing Lidar/satellite/point cloud methods for assessment of fuel characteristics
- Assessing drivers of woody fuel consumption:
    - for fire intensity, habitat, carbon accounting,
      smoke production and emissions

An efficient and comprehensive field protocol for assessing fuel characteristics for fire behaviour modelling in Australian open forests ☆,☆☆

Jennifer J. Hollis[a,*], Miguel G. Cruz[b], W. Lachlan McCaw[c,d], James S. Gould[b], Stephanie A. Samson[a]

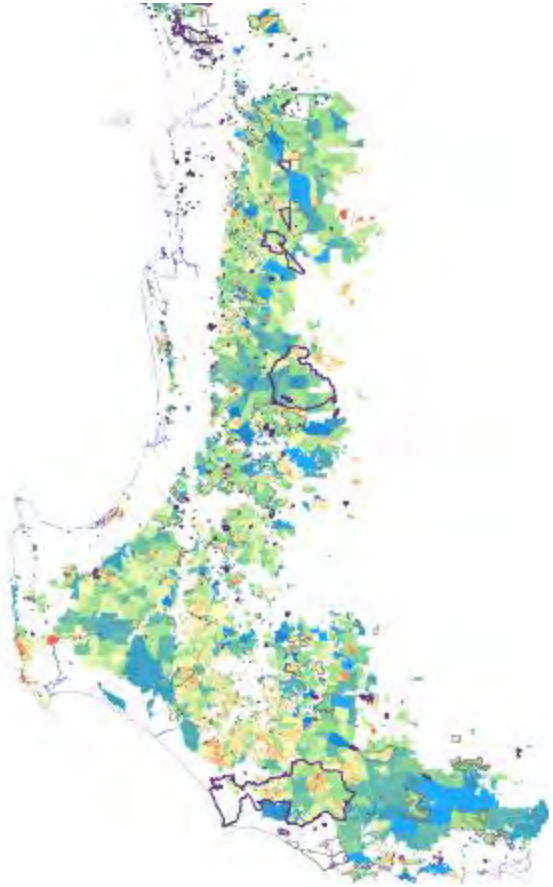
Department of Biodiversity, Conservation and Attractions

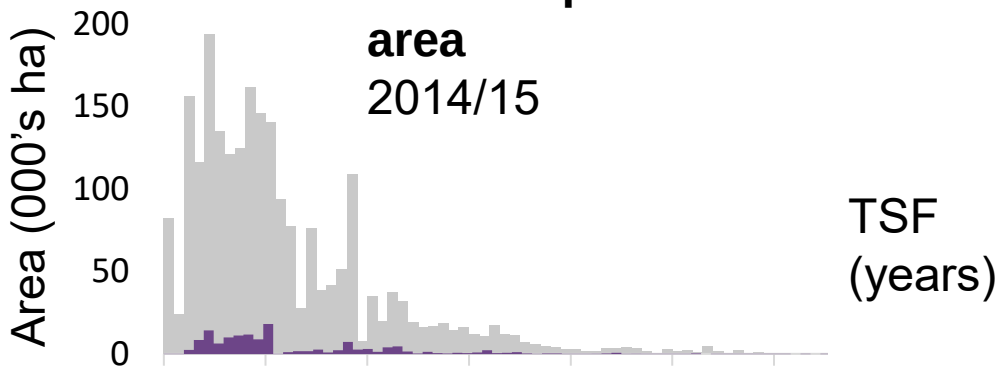
PARKS AND WILDLIFE SERVICE

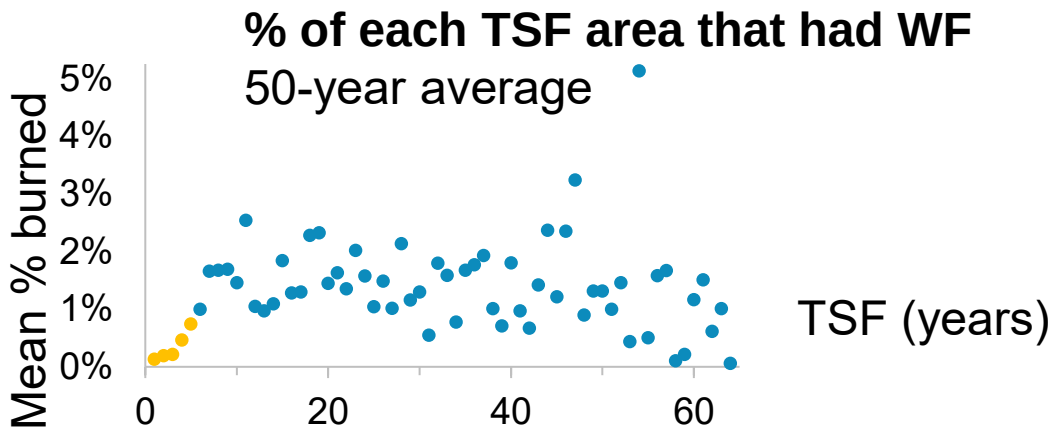
Assessing the effectiveness of prescribed burning in reducing wildfire risk

Landscape TSF distribution (time since fire)

June 2014 1 94 years







Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Effectiveness of burning in reducing wildfire risk

DBCA Fuel Management Zones

Dry and Wet Eucalyptus forests:

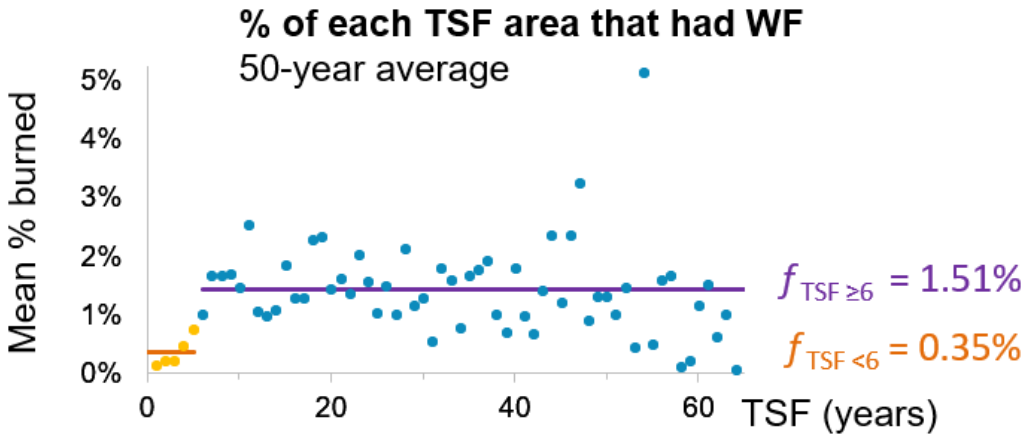
Landscape Risk Reduction FMZ
45% of area <6 y

Settlement Hazard Separation FMZ 60% of area <6 y

flammability

area-weighted mean annual wildfire likelihood

Wildfire extent (or likelihood) is 2-10 (average = 4.5) times lower in fuels <6 years. FMZ targets are effective in reducing wildfire extent



Miller, Tangney, Fontaine, Hollis, Huntley (in prep)
Assessing the effectiveness of prescribed burning in mitigating wildfire risk from 50+ years of fire history data

Department of Biodiversity, Conservation and Attractions

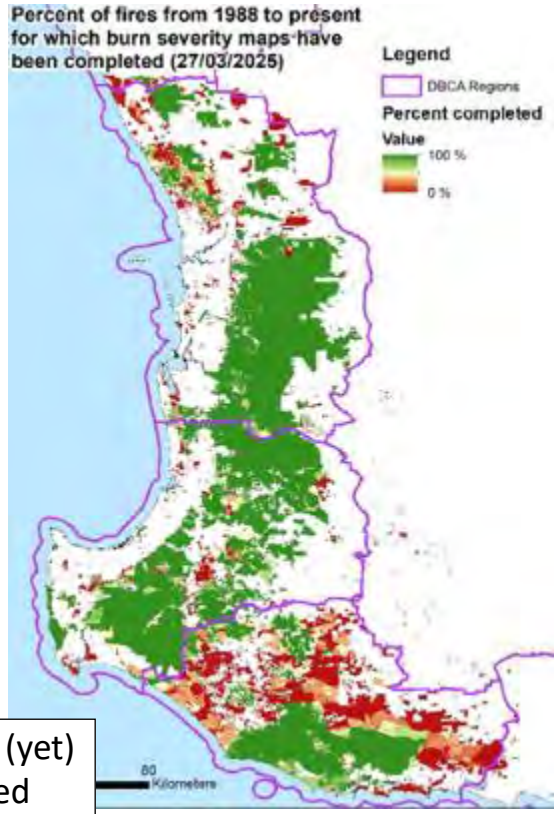
PARKS AND WILDLIFE SERVICE

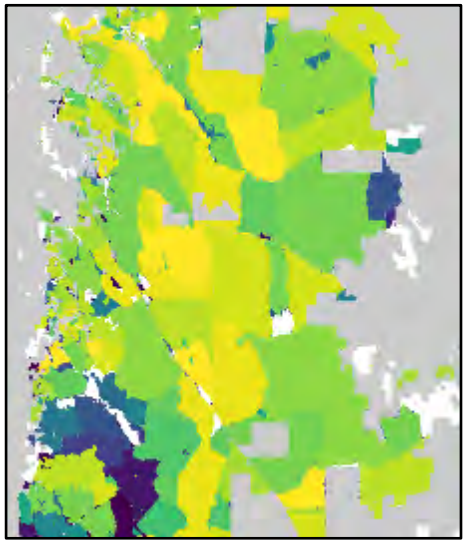
Understanding fire regimes

Improving current and past fire/fire regime data 1988-present

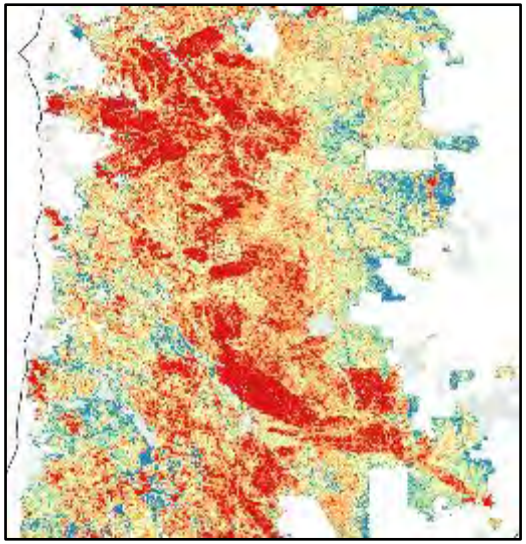
- Fire severity / history mapping SW forests.
- ~1000 field assessments to correlate with dNBR

Methods by Densmore *et al*. (2023) OzCBI: the composite burn index adapted to assess fire severity and fauna habitat... *Aust. Forestry* **86:** 1-21





TSF – old mapping



Fire severity - Max observed since 1988

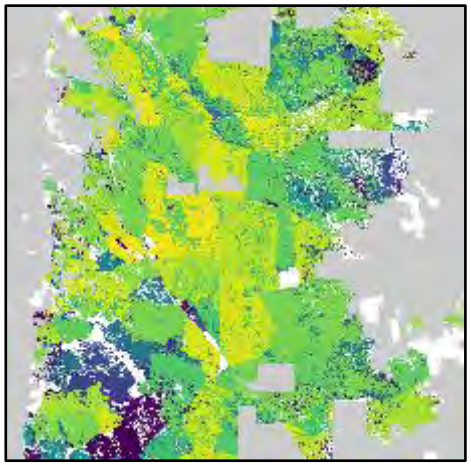
No fire (yet) recorded

Severity

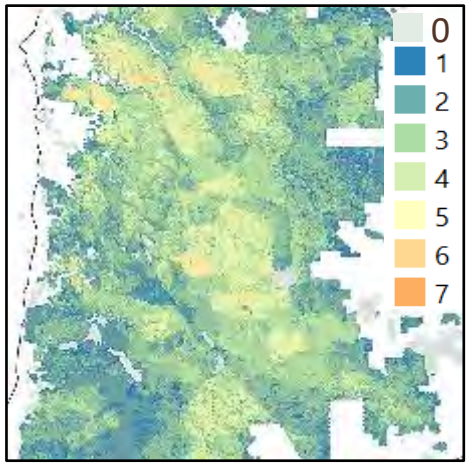
- Unburnt
- Low
- Moderate
- High
- Very high

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE



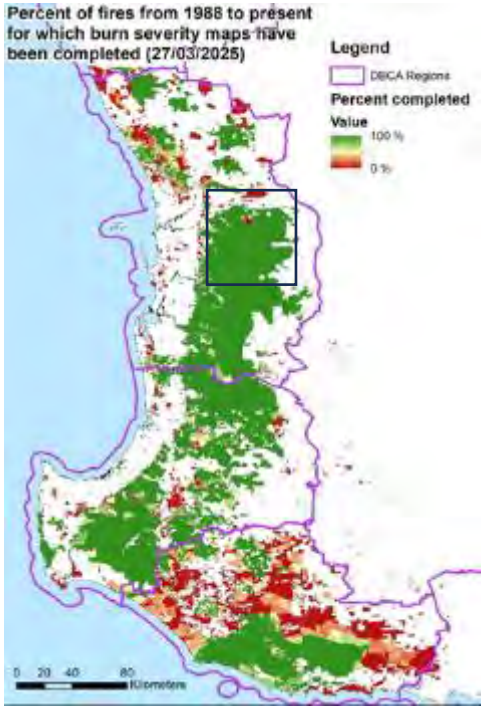
TSF – updated data

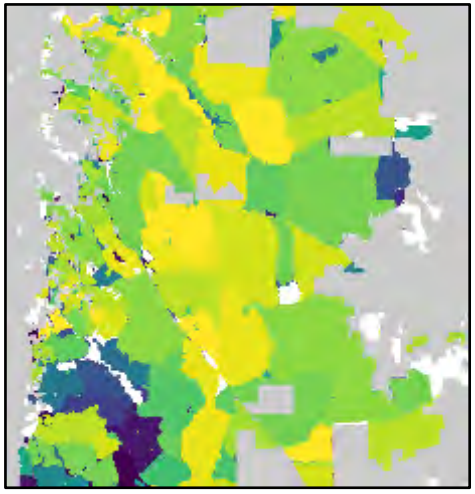


Fire frequency

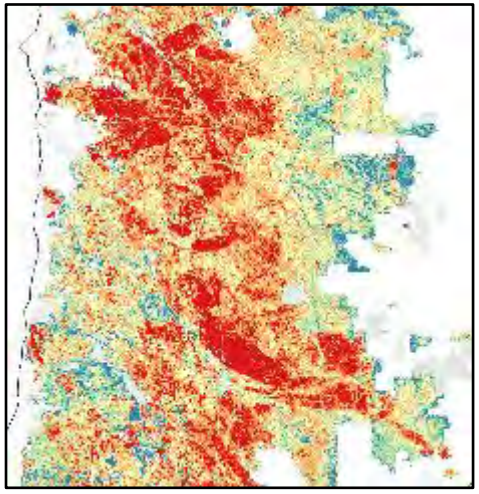
Improved:

- Resolution
- Accuracy
- Information
  - Severity
  - Date
  - Patchiness

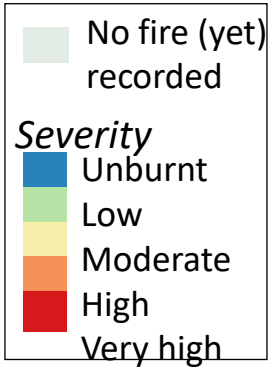




TSF – old mapping



Fire severity - Max observed



Understanding effects of varying fire regime

- Long term study: season + interval (Burrows et al 2019)
  - running since 1986, 1987
  - 2 sites in southern Jarrah forests
  - 7 treatment blocks:
    2 season × 3 interval treatments, + fire exclusion
  - Assessing fuels, vegetation structure,
    plant community composition
- Intensive survey: season + severity
  (Tangney *et al* in prep)
  - Assessing understorey seedling recruitment
  - Comparing spring and autumn fire and high, moderate and low severity effects
  - over 3 years after 11 fires in 330 plots

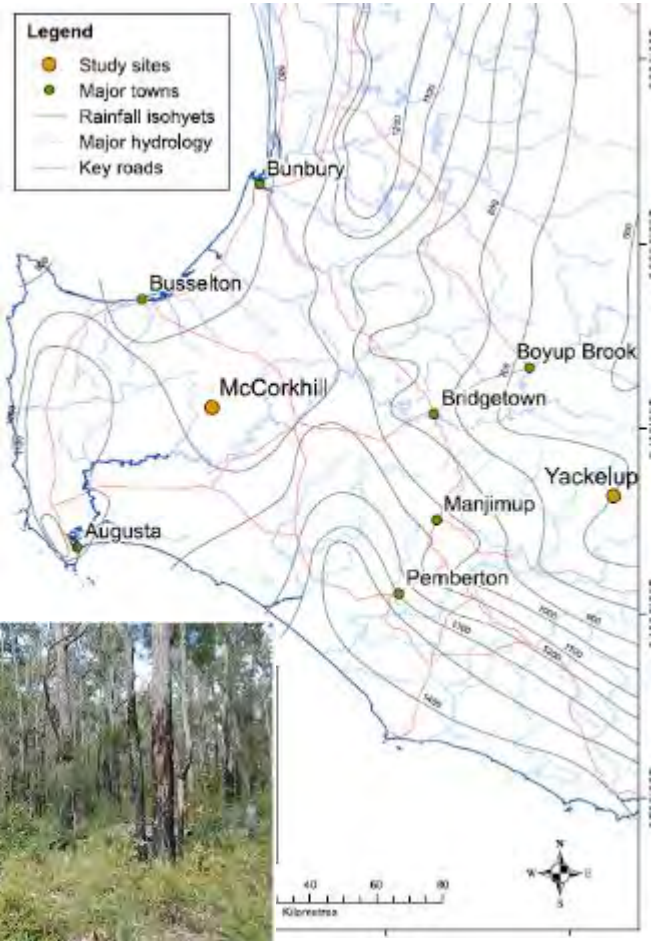


Fig. 2 Frequent spring fire treatment (1.5 fires per decade) in high-rainfall McCorkhill forest, Western Australia. Photo taken December 2018, five years after last fire. Photo by Neil Burrows

Testing alternate approaches: fine grained mosaic

Fuel monitoring

Fire behaviour, mosaic outcomes

Fauna and vegetation responses

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Testing alternate approaches: waterpoint management. Collaborations

Slide 156: Stakeholder presentation – Fire Science Program
Walpole 11 June 2025

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

PEAT

Protecting Peatland Ecosystems and Addressing Threats in

Southwestern Australia

PEAT is a transdisciplinary research project advancing the understanding and sustainable management of southwestern Australia's peatland ecosystems.

The project is guided, co-designed, and delivered in partnership with Aboriginal Elders, scientists, land managers, museums, government bodies, and local communities.

The Ian Potter Foundation

THE UNIVERSITY OF WESTERN AUSTRALIA

AUSTRALIA ECU EDITH COWAN UNIVERSITY

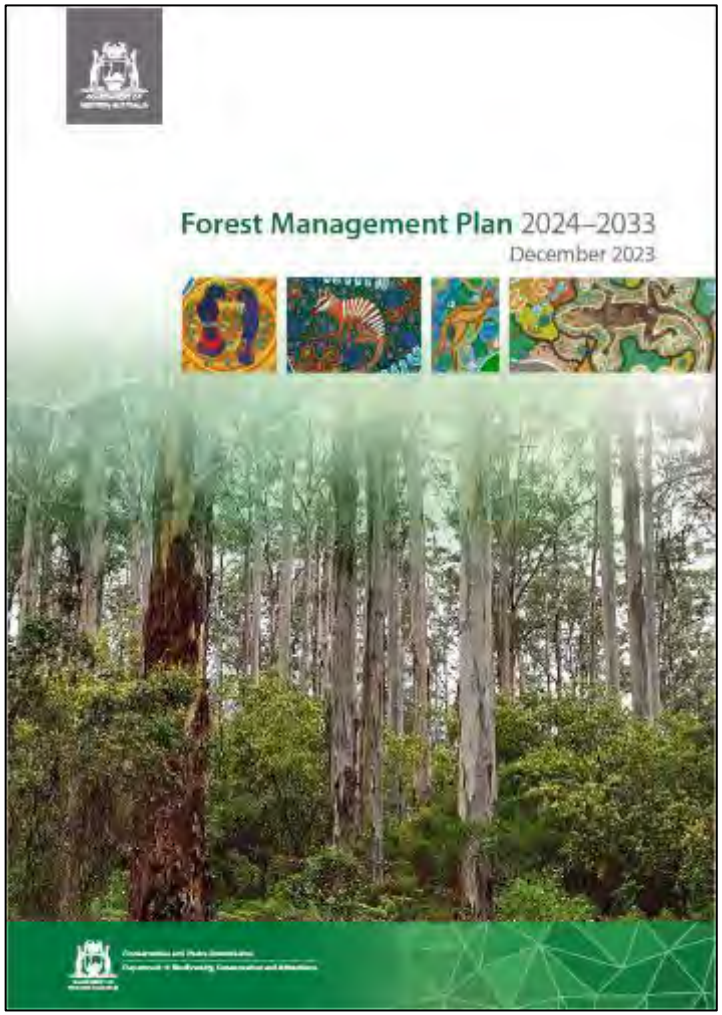
WALPOLE NORNALUP NATIONAL PARKS ASSOCIATION

WAM

Department of Biodiversity, Conservation and Attractions

Understanding sensitivity of peat and heathland ecosystems

- PEAT collaboration
  - Assessing peat vulnerability to combustion
  - PhD project on fire regime effects on plant community composition, population dynamics of key species
  - Developing fire severity algorithm to support mapping
- On-ground heath severity survey to calibrate remote-sensed mapping



Forest Management Plan 2024-33 Fire Research Collaboration

a scientific research program into prescribed burning, with the aim of investigating the measured impacts on forest ecosystems and biodiversity from fire management strategies and bushfires, to be carried out for the 10-year life of the FMP, without compromising the broader responsibility of prescribed burning.

- *design and implementation of the research and review of the results should involve DBCA scientists and experts in the field, including those in the various research institutions in WA.*
- *provide advice to the Minister, CPC and DBCA.*
- *enable decisions regarding current practices to identify adjustments to protect vulnerable aspects of biodiversity*

Forest Management Plan 2024-33
Fire Research Collaboration

- Funded July 2024
- Workshop, + pre-& post-workshop surveys: to identify research needs,
  - ~90 invites, 60 attended / responded
  - 21 organisations: all 5 WA universities, CSIRO, WA museum, BirdLife, DBCA, Leeuwin group, SW NRM, unaffiliated experts, etc.

  → 58 questions prioritised top 12 →
- 2, 4-year, phase-1 agreements
  - Murdoch: Flora+
  - ECU: Fauna+
- Developing implementation plans

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Forest Management Plan 2024-33 Fire Research Collaboration

Top 12 research questions

Theme
Fauna
Traits, mechanisms
Flora
Other

1. What are the population dynamics of threatened fauna in relation to **time since fire**, does this depend on **fire severity**?
2. What are suitable **fire intervals** for vulnerable ecosystems?
3. How are plant and ecosystem responses to varying **fire interval or season** influenced by the timing and severity of **climate events**?
4. Which ecosystems are most vulnerable to fire?
5. What attributes render ecosystems most vulnerable to effects of **varying fire regime elements (season, severity, interval**)?
6. Where do species occur that are vulnerable to **varying fire regime** elements?
7. How will **climate change** contribute to change in **fire regimes** across ecosystems?
8. What is the effect of varying **fire severity** on key habitat attributes (logs, hollows and other resources provided by large trees?
9. How do **spatial fire mosaic** attributes of varying habitat successional age patches influence fauna dispersal, recolonisation, and use
10. How are fauna **responses to fire** influenced by the timing and severity of climate-stress events (drought, heatwaves, die-off)?
11. Can we use **fire management** to mitigate drying of mesic refugia, peats, riparian vegetation and permanent pools?
12. Do fire **interval-severity/ patchiness trade-offs** mitigate short interval effects at population level for interval-sensitive flora?

Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

Fauna research

Review

Synthesis of the effects of fire on WA threatened fauna

- Input from 25 fire and fauna experts: 4 universities, 2 museums, DBCA, DPIRD, CSIRO
- Birds, invertebrates, mammals, reptiles, frogs, fish
- ~170 fire response studies and observations summarised in a database

Field experiments

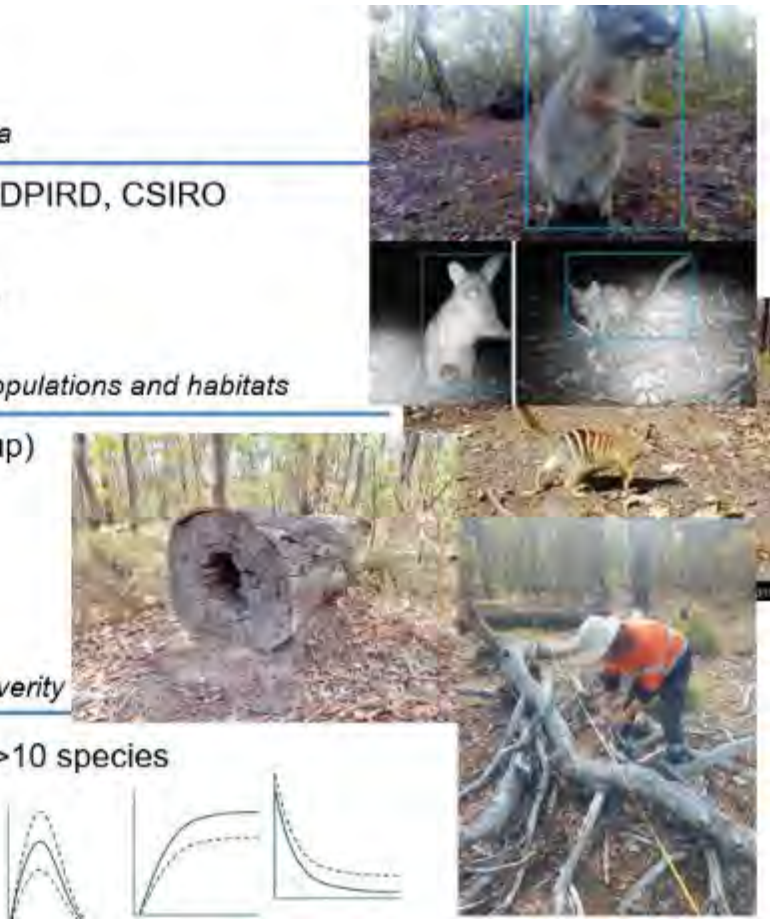
Effects of prescribed burns on threatened mammal populations and habitats

- Camera trapping and spotlighting in southern jarrah forest (E of Manjimup)
- Multi-year experiment
- Numbat, chuditch, woylie, ringtail possum and many other species
- ECU Masters: pre- and post-burn surveys of hollow logs

Data modelling

Mammal relationships with time since fire and fire severity

- 35 years of monitoring data in Donnelly District: >1 M detection events, >10 species
- Statistical modelling to determine how species occurrence changes with time since fire (0-55 years) and fire severity (low/high)



Flora research

Critically endangered *Andersonia annelsii*

Review of fire regimes impacting threatened species populations

- Review and collate threatened species traits
- Document fire regime since the 1980's.
- Assess plant traits & regime attributes posing the most risk, including absence of fire

Peat soil moisture and seasonal flammability

- Assess moisture dynamics with time since fire over seasonal cycles.
- Support prediction of peatland vulnerability by correlating in-situ soil moisture and seasonal weather data.

UWA Masters' student assessing vegetation structure using drone-based Lidar

Orchid phenology and seasonal vulnerability to fire impacts

- Track *Caladenia erythrochila* phenology through flowering and tuber development, accompanied by long-term microclimatic monitoring.
- Identify environmental triggers of tuber development to predict orchid vulnerability to fire.

Caladenia erythrochila (P2) Blood orchid