Annexure SE-5

Tjoritja / West MacDonnell National Park

Report on the January 2019 Bushfire
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Tjoritja / West MacDonnell National Park

## Contact Details
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## Acronyms

<table>
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<tr>
<td>AIIMS</td>
<td>Australian Interagency Incident Management System</td>
</tr>
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<td>APB</td>
<td>Aerial Prescribed Burning</td>
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<td>BEMS</td>
<td>Bushfire Emergency Management System</td>
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<td>BFNT</td>
<td>Bushfires NT</td>
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<tr>
<td>CDU</td>
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<td>DENR</td>
<td>Department of Environment and Natural Resources</td>
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<td>ICS</td>
<td>Integrated Conservation Strategy</td>
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<td>IMT</td>
<td>Incident Management Team</td>
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<td>NT</td>
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<td>NTG</td>
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<td>PWH</td>
<td>Parks, Wildlife and Heritage Division</td>
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<td>WebEOC</td>
<td>Critical Incident Management Information Monitoring System</td>
</tr>
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1. Executive Summary

A large and damaging bushfire occurred at Tjoritja / West MacDonnell National Park in January 2019. The fire was started by a lightning strike in a dry storm on the evening of Saturday 12 January 2019 in the rugged hills of the Alice Valley, north of Namatjira Drive and east of the Hugh River.

The response to the event was significant, spread over a period of 15 days and involved 81 personnel from Parks, Wildlife and Heritage (PWH), Department of Environment and Natural Resources (DENR) including Bushfires NT (BFNT), and Fire and Rescue (PFES). The fire extended over 90 km from Jay Creek in the east to Redbank in the west, creating a variable pattern of fire intensity and patchiness within a total area burnt of 660 km², or 22% of the total park area.

There was no loss of life, no injuries, and all three major infrastructure nodes within the fire extent of the West MacDonnell area were protected and undamaged (Standley Chasm Visitor Centre, Ormiston Gorge Ranger Station and Visitor area, and Glen Helen Tourist Resort). Additionally, other infrastructure nodes, including most Park visitor areas, commercial campground areas and Aboriginal Living Areas were protected. The fire affected significant portions of the Larapinta Trail resulting in the need for a substantial staff and volunteer effort to get the trail operational before the 2019 walking season.

A post fire debrief in February 2019 brought together the three NT Government Agencies and many of the personnel involved in the fire. A list of actions was developed to help build on the successes of the management of the fire by identifying areas of improvement. PWH has since developed an actions register that will ensure that recommendations are not lost with clear lead action officers identified and timeframes set for implementation. The debrief brought to light shortfalls in processes for scaling up first responses, the risk profile of remote area fire suppression, the need for increased interagency training and staff exchanges to increase shared understanding of the risks and challenges.

Building on the lessons from the Tjorita fire and the need for new policies and procedures as recommended in the actions register, PWH has commenced a review of all policies, guidelines and procedures to develop a new fire management framework. The review will include a capability assessment against projected fire conditions in the NT to inform a stepped plan for adapting PWH operations to meet capability needs for projected conditions. Initial scoping of areas for improvement on park that will reduce the risk of dangerous and damaging fires includes more fuel break management, increases in aerial prescribed burning, improvements in ranger training, the use of contract labour, upgrades to light attack units and consideration of the need for plant and equipment in fire response, and increased involvement in community based fire abatement programs.

Other states and territories that have completed fire disaster reviews stress the importance of whole of landscape, collaborative fire management. Several actions raised at the interagency debrief following the Tjorita fire are also focused on improved collaboration and communication in response efforts. It is clear that engaging and collaborating in landscape scale fire management programs and improved interagency process and procedures will be an important component of adapting PWH operations to future needs.

2. Background

Tjoritja / West MacDonnell National Park (2568 km²) in Central Australia stretches 161 kilometres west from the edge of Alice Springs. It is internationally recognised for its natural environment and as a place of cultural importance. The Park lies within the MacDonnell Ranges bioregion; one of 85 bioregions identified nationally. The Greater MacDonnell Ranges are recognised as an international Site of Conservation Significance for its threatened species, endemic species, floral diversity, geological formations and wetland values.
Despite its significant biodiversity value, the Park is a modified landscape; having previously been used as a cattle station. Buffel grass (*Cenchrus ciliaris*) is the main environmental weed on the Park; originally introduced to the region for dust control and later as feed grass for cattle. Buffel grass has played a significant role in the extent and severity of this wildfire. This grassy fuel helped transfer the fire across the park via the many creeks and rivers that it infests.

Land managers have no answer to broad scale buffel grass control at this stage and the Central Australian Regional Fire Committee (BFNT) has listed buffel grass as one of the main wildfire risks for Central Australia.

The use of fire in creek lines to reduce fuel loads has been constrained due to the fact that it promotes buffel grass and causes long term damage to the river system ecology through the damage of healthy River Red Gums. This significantly adds to the complexity of fire management in this Park.

### 2.1. Fire Management of Drainage Systems in central Australia Parks

River Red Gums occur along more than 7000km of drainage lines across 50 million hectares in central Australia (Geoscience Australia 2015), which form a network across the landscape. River Red Gums have a particular value as large keystone plants in an arid region otherwise dominated by shrubby acacias (Bowman and Connors 1996). These extensive networks of river corridors are extremely important for healthy ecological function in arid zones (Colloff 2014; Nano & Clarke 2011).

There are two types of drainage lines systems in central Australia.

- The large sandy river systems and associated broad floodplains with River Red Gum dominant along the channels and other large overstory trees such as Ironwoods and Corkwoods. There may be a midstory of mixed shrubs and an understory dominated by buffel grass and couch grass along the channel margins and islands.
- The small rocky creeks systems with melaleuca and mixed grasses that are the headwaters of the large sandy rivers. The density and continuity of buffel grass in these areas is more variable, however it is steadily increasing and spreading further upstream.

Over the past 30 years, our observations and monitoring have confirmed that both systems are vulnerable to ecosystem change in their mid- and overstory species caused by increased frequency and intensity of fire events in buffel and couch fuel areas.

In the rocky creek systems melaleuca communities are being reduced and have been eliminated in local areas. In the sandy river systems there has been a decrease in ground-species diversity, a decrease of midstory diversity and changes to the crown condition, habit and density of the 3 iconic overstory species; River Red Gums, Ironwood and Corkwoods.

Thirty years ago our initial approach to the increased fire risk of buffel grass along the river systems was to burn it, with our knowledge at the time that the mid- and upperstory species had a resilience to fire and would re-sprout and recover. Unfortunately, as we continued to re-burn the rapidly recovering buffel grass, it become obvious that we were damaging the tree communities that we were trying to protect. We learned that their rate of recovery was slow and their resilience was only to infrequent fires.

Our fire programs changed and are continuing to evolve as buffel grass is spreading further across the landscape into more vegetation communities and ecosystems. Management prescriptions for these drainage systems are focused on reducing risk from ignitions by burning and or slashing in areas that are at risk from deliberate ignitions. It includes linear fire breaks between areas of thick fuel on river flats to restrict and contain the spread of fire within sections of river. Prescribed fire is generally excluded from these habitats apart from small areas which are
designed to mitigate the spread of fire. Small areas with large River Red Gums, Ironwoods and Corkwoods can be managed by slashing around established trees before burning the surrounding buffel grass plus follow-up herbicide spraying. However our challenge associated with this minimalist burning approach in these portions of the landscape is our management capacity to reduce fuel connectivity and maintain effective linear fuel breaks throughout our Park estate.

2.2. Tjoritja Fire Management Program

Fire management plans and reports are directed by the Tjoritja / West MacDonnell National Park Integrated Conservation Strategy (ICS). There is an annual cycle of fire management on our Parks that is consistent across the NT. Fire plans for central Australian parks are prepared in March annually.

There are three standard components within each fire plan:

A review of the fire program over the previous 12 months.
- The review includes a summary of prescribed burns, fuel break management, unplanned fires and suppression response, staff effort and indicative costs.

A seasonal bushfires assessment (SBA) to determine upcoming fire potential
- The assessment is based on the patterns of rainfall and grass growth during the preceding 12 to 24 months, the extent and impact of recent fires, both prescribed and unplanned, and the state of our fuel breaks and our management capacity. The assessment is based on the state within our Parks as well as the surrounding region. The SBA engages with our neighbours and BFNT and contributes to a NT and national fire potential assessment program.

A program of actions for the next 12 months.
- Actions are focused on the period from March/April to July/August, when seasonal conditions are optimal for prescriptive activities. The aim is to protect assets, including infrastructure, cultural and environmental values, maintain fuel breaks as required by legislation (Bushfires Management Act) and manage fuel loads to reduce the risk and impact of unplanned fires which primarily occur during the period from August/September to January/February.

2.2.1. Resourcing

A significant amount of fire management has occurred on the park in previous years. This had been boosted by the extra funding provided through the federally funded Red Centre Biodiversity Fund (RCBF).

The number of mitigation fires carried out between 2015 and 2017 were made possible through the RCBF which also allowed cross tenure fire management.

RCBF funding of $1 163 000 was provided over five years. Funding for fire and weed management over that time was approximately $300 000 and funding ended in June 2017. The overall funding also included Aboriginal employment and capacity building; important in effective joint management and input from Traditional Owners. The project demonstrated that significant resources are required if fire mitigation is to be effective.

Mitigation works in 2018 included:
- aerial incendiaries - a number of attempts were made but fuel loads that burnt during the wildfire did not burn earlier in the year
- weed control - buffel grass around infrastructure and visitor nodes was undertaken
Wildfires that occurred in January to March 2018 in the eastern and central parts of the Park also became good firebreaks during the wildfire for those areas.

<table>
<thead>
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<th>YEAR</th>
<th>ORMISTON</th>
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<tr>
<td></td>
<td># FIRES (Polygons)</td>
<td>Area (km²)</td>
</tr>
<tr>
<td>2015</td>
<td>39</td>
<td>24.6</td>
</tr>
<tr>
<td>2016</td>
<td>25</td>
<td>3.2</td>
</tr>
<tr>
<td>2017</td>
<td>87</td>
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2.2.1.1. Table 1 - Summary of areas of the park burnt over the previous four years

3. Tjoritja Wildfire

3.1. Conditions

The Tjoritja fire was started by a lightning strike in a dry storm on the evening of Saturday 12 January 2019 in range country north of Namatjira Drive and to the west of the Hugh River.

Over the period during which the fire burned, the Alice Springs region experienced an extreme heat wave event with the average maximum temperature being 43.4 degrees Celsius and the average minimum being 26.7 degrees Celsius. At the same time, relative humidity at 3pm averaged just 12% and daily average maximum wind gusts reached 60km/hr, resulting in challenging extreme fire weather conditions.

Fuel loads were not considered to be high as a result of the prevailing dry conditions that had been experienced throughout Central Australia in 2018, where just 129mm of rain was recorded. However, Buffel grass responded well to 62mm of rain in November 2018, and had then become fully cured by the extreme heat of December 2018 and January 2019.

3.2. Extent

Over the following 15 day period this fire burnt a total area of approximately 661.21 Km², approximately 22% of the total park area. See Appendix 1 for fire extent and pattern maps.
### 3.2.1.1. Table 2 – Summary of Area Burnt by land tenure in the 2019 Wildfire

<table>
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<td>Owen Springs Reserve</td>
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</tr>
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<td><strong>663.8</strong></td>
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3.3. Response

Coordination and control of the fire was led by the DTSC with support from BFNT. Approximately 81 personnel worked tirelessly on the management of the fire including staff from the DTSC PWH Division, DENR, BFNT staff and volunteers and PFES staff and volunteers. Additional personnel were also deployed from Darwin and Katherine regions to control what was an extreme fire event.

PWH responded to community concerns through radio interviews and an open seminar in conjunction with Charles Darwin University (CDU) scientists in Alice Springs. In several radio interviews, the PWH responded to a variety of questions regarding the impact of the fire on the River Red Gum communities and our management programs.

The continuing public interest in the January 2019 fire prompted PWH, in conjunction with CDU to hold a public seminar at CDU on 22 Mar 2019 to provide more detail on the fire event. Approximately 70 people attended the 1-hour seminar.

Associated with the issue of management of buffel grass, it was proposed that Tjoritja / West MacDonnell National Park should be opened to cattle grazing programs to reduce the buffel grass fuel loads and fire risk. PWH explained although a significant proportion of the Park has previously been part of pastoral properties, the Park was established in recognition of its outstanding natural and cultural values and the associated visitor opportunities.

The second issue of concern was a perceived limited response capacity that should have involved aerial suppression operations using water bombing from helicopters and/or aircraft. There is a relatively high level of public awareness that water bombing from helicopters and/or aircraft is a feature of aerial suppression operations in other jurisdictions. This is linked to news stories and spectacular videos from locations in southern Australia and around the world. The common factors of these locations and operations are:

- proximity to large population centres with an extensive rural interface;
- high risk of loss of life;
- high value infrastructure and/or forestry and agricultural assets;
Tjoritja / West MacDonnell National Park

- significant availability and capacity of fire response vehicles and personnel;
- vegetation and fuel loads that will sustain high intensity fires; and
- forecasted high fire potential linked to seasonal conditions.

The January 2019 fire in Tjoritja / West MacDonnell National Park did not meet any of these conditions.

Even after the fire had been burning for a week and was proving very difficult to suppress, there was limited justification to call for aerial operations. These included:

- low risk to loss of life;
- low risk to loss of high value infrastructure;
- lack of available aircraft (without diminishing the fleet's value to other priority and state of emergency declared areas and active fire suppression activities occurring in other parts of Australia at the same time);
- lack of experience and/or capacity to support the aircraft at the Alice Springs airport, including water refill operations; and
- the high cost of the operations.

3.4. Recovery

The renowned Larapinta Trail was significantly impacted in sections, with section 3 (Standley Chasm area) and 9 (Ormiston Gorge area) of the 12 sections, being the hardest hit by the fire.

The local community rallied together to assist rangers with assessment and remediation work along the Trail so that the trail could be opened in April for the 2019 season.

As part of the program to assess the impact of the January 2019 fire, PWH provided support to two CDU scientists to assess the impact on the River Red Gums communities along Ormiston Creek. Dr. Christine Schlesinger and Ms. Erin Westerhuis, a PhD student, had established a set of six monitoring sites along Ormiston Creek in 2015 that provided pre-fire information on the characteristics of the River Red Gum community. They re-surveyed the sites in Feb 2019 and Parks and Wildlife collected aerial oblique images of their sites to complement their ground data.

3.5. Post-fire Debrief

A debrief of the response to the January 2019 Tjoritja bushfire was held on Tuesday 12 February 2019. It focused on how the agencies worked together and where improvements were required, resulting in a list of actions to be delivered by various agencies. PWH has subsequently developed this information into an Improved Fire Management Actions Register (Appendix 2), to improve and strengthen existing management actions and to introduce new processes and systems.

All actions in the Improved Fire Management Actions List Register are reviewed regularly by the PWH Executive Leadership Team to ensure timely progress and implementation to reduce future fire risk, specifically for Tjoritja / West MacDonnell National Park, but also fire management across all parks and reserves more generally.

A working group will be established with DENR/Bushfires NT and PFES to ensure that progress is maintained on interagency actions to be completed.

4. Current and Future Park Fire Management

4.1. Current Management
Wildfire is a major public safety risk and threat to biodiversity values of parks across the Northern Territory. Factors that are increasing fire risk levels include; increasing infestation of exotic grasses (Gamba Grass in the Top End and Buffel Grass in Central Australia) creating unnaturally high fire fuel loads, climate change bringing more frequent extreme fire weather, growing park visitor numbers at key parks and reserves, increasing urbanisation near parks and a rising number of commercial enterprises within and adjoining parks.

To manage this risk, fire mitigation and management is a major component of work programs across all parks. An annual cycle of well-conceived and well planned fire management is applied consistently across NT parks.

The development of Integrated Conservation Strategies (ICS) for our Class 1 Biodiversity and Visitor parks has contributed to an improvement of our annual fire plans for those parks. The ICS focuses park management by identifying and mapping the values, which informs the appropriate strategies to manage each value and set targets to assess the condition of each value. As a result, our ICS parks can prepare an Annual Fire Report, complementary to the Annual Fire Plan, with a greater level of detail than the review component of the Fire Plan.

ICS’s are not solely focused on fire, and recognise that weeds and feral animal management are key parts of our park management program. Each value within an ICS annual plan includes strategies and actions for fire, weeds and feral animals to ensure that planned activities are not lost between separate documents. This approach ensures that our actions are complementary. For example, a spraying program for weeds can double as fire management in many areas.

Our fire management program across all our Parks is well planned and executed within the allocated resourcing. Despite this high level planning, fire risk in many high visitation parks is increasing, posing significant public safety risk. It is also increasingly challenging to protect areas of high biodiversity value.

It is well recognized that new and stronger approaches to fire mitigation and management are needed to manage these increasing risks, secure parks’ ecological protection and provide for the growing parks visitor numbers and infrastructure underpinning the broader NT tourism industry. For this reason the PWH Division will be undertaking a capability review against projected bushfire conditions in the NT. Because the Territory circumstance of low population densities and top-end and central Australian ecosystem type is unlike other states, there seems little to be gained by comparing the PWH capability with other state park and wildlife agencies.

4.2. Strengthening Fire Management Programs

Initial internal scoping of opportunities to strengthen the fire program has identified the following six elements that would help reduce the risk of unplanned, potentially damaging fires to a consistently more acceptable level. These are:

- **Fuel break management** – methods used, often in combination, include mechanical (grading and slashing), chemical (herbicide) and burning along fuel breaks. Mechanical methods are often contracted at high cost. Chemical herbicides may be applied by rangers or contractors. Ground-based prescribed burning is labour and skills intensive.

- **Aerial Prescribed Burning (APB)** – involves dropping incendiaries from helicopters to fragment fuels especially over large areas and inaccessible land. Helicopter hire is very expensive. Flying time is minimised to save costs, meaning that effective APB operations often require complementary ground and cumulative burning to achieve desired results.

- **Ranger training and capacity** – rangers must meet minimum formal training standards. Staff turnover means that formal and informal training is a costly, ongoing commitment. There is a lack of NT-based providers for more advanced training.
Contract labour — our capacity to achieve annual asset protection and environmental objectives is often limited by staff numbers and availability. Seasonal rangers could be employed or Aboriginal ranger groups engaged on a fee for service basis for a variety of fire mitigation work including mechanical and chemical fuel management and prescribed burning to establish fire breaks, reduce and breakup fuel loads across parks.

Fire hardware — vehicle-based fire units, weed spraying and other equipment is old and/or insufficient across most parks. Equipment upgrades would vastly improve fire program efficiency and staff safety.

Community-based collaborative fire abatement programs, such as those in place at Nitmiluk and Judbarra/Gregory National Parks, are effective in reducing fire risk and engaging Aboriginal rangers in fire management. They require significant resources in planning and building local capacity although these resources may be offset in future years by revenue from the sale of carbon credits in future years.

5. Conclusion

The major lessons from the Tjoritja Wildfire are that there is a need for PWH to review its fire management practices to strengthen collaboration, preparation and response capacity. New challenges are occurring in the management of fire including the spread of high biomass grasses and worsening fire weather conditions. All policies, guidelines and procedures are to be reviewed, with a new fire framework to be implemented. The review will include a capability assessment against projected fire conditions in the NT. This will assist to develop a stepped plan and costings for adapting PWH operations to meet capability needs for projected conditions.

Actions that have been raised at the interagency post event briefing require tracking and closing out and PWH has developed the actions list into a tracking register.

Engagement and collaboration are an essential part of fire management programs. There are new fire management programs occurring adjacent or close to our parks and reserves which PWH needs to engage with. Improved collaboration and engagement across agencies is also required.
6. Appendix 1 – Fire Extent and Pattern Maps

6.1. Map 1 – January 2019 fire extent and pattern at 150 kilometres
6.2. Map 2 – January 2019 fire extent and pattern at 100 kilometres
7. Appendix 2 – Improved Fire Management Action List Register

See separate document (TRM DPW2020/0037~0001)
8. Appendix 3 - Photos

8.1. Photo 1 - Standley Chasm Tourist Centre – post fire aerial oblique view looking north.

![Image of Standley Chasm Tourist Centre - post fire aerial oblique view looking north]
8.2. Photo 2 - Ormiston Gorge Ranger Station, Campground and Visitor Centre – post fire aerial oblique view looking west
8.3. Photo 3 - Serpentine Chalet Track and World Expeditions Commercial Camp – post fire aerial oblique view looking northwest
8.4. Photo 4 - Ormiston Creek to Mt Sonder – post fire aerial oblique view looking west
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