Date : 23/11/2020 8:06:15 AM
From : "HEAD Damien"
To : "CUBIS Mick"
Subject : FW: Cost of Air Craft and Use on K'GARI (FRASER)
Attachment : PrintResult.pdf;image001.jpg;

Looks like some success with the bombing.

From: Tony Johnstone <Tony.Johnstone@qfes.qld.gov.au>
Sent: Sunday, 22 November 2020 11:41 AM
To: HEAD Damien; Damien-Head@qld.gov.au
Subject: Cost of Air Craft and Use on K'GARI (FRASER)

Damien,

Thanks for your time this morning.

For transparency, below is an extract from an email in regards to using air assets on K'GARI (FRASER)

- For the purposes of being able to apply timely application of resources QPWS are happy to allow engagement of high-level air resources if an effective strategy can be determined.
- The area of highest priority/concern is the area south of the Moon Point Track and west of the Northern Road. My understanding is that an ***effective strategy for managing this area is as follows***:
    - Use of LAT + 802 waterbombers/gel to be used where environmental concerns can be addressed.
    - Specific tactics:
        - Squeeze flank northwards from south.
        - Black-out backing fire (to west).
    - Back-up Fireline control work by ground crews.
- ***This is not confirmation that QPWS will pay for the above air resourcing. Payment to be sorted out at a high level between DES and QFES.***

Other areas of concern which are currently a lesser priority than the above are also being adequately managed by the IMT and are listed below:

- Moon Point Road east of the Northern road.
- The area around Cathedrals on Fraser.
- Sandy Cape lighthouse.

As discussed on the phone:

- The Large Air Tanker (LAT) is worth $10,000 per hour plus product . ($700 for Gel)
- 802 Air Tractor (wheels) $3000 per hour
- 802 Fire Boss (803 with floats) $5,500 per hour.

A Fire Boss is more effective if water is close by, they can also pick upsalt water if authorised. 802 will have to be resupplied throuhg an air base, so there can be some delays.
As indicated this morning you are happy for the cost of the aircraft as discribed in the streatgy above to be costed to QPWS.
I have also attcahed acopy of a map that shows the fire which I believ the above stratgy is to be used on.
Any concern splease let me know.

Regards

Tony Johnstone

Chief Superintendent

Director Regional Coordination Rural Fire Service

Queensland Fire and Emergency Services

P 07 3635 3835 **M** Personal info

Classified as OFFICIAL

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Aerial mapping 22 nov

153°2' 153°4' 153°6' 153°8' 153°10' 153°12'

-25°12' -25°13' -25°14' -25°15' -25°16' -25°17' -25°18' -25°19' -25°20'

Legend

Current Incidents

- FIRE VEHICLE *
- FIRE VEHICLE *
- FIRE VEGETATION
- FIRE VEGETATION EXPOSURES
- (FIRE VEGETATION)
- PERMITTED BURN (ATTENDANCE)
- HAZARD *
- HAZARD *
- HAZARD *
- HAZARD *
- HAZARD *
- FIRE STRUCTURE *
- FIRE STRUCTURE *
- FIRE STRUCTURE *
- FIRE STRUCTURE *
- FIRE STRUCTURE *
- (FIRE STRUCTURE)
- ASSIST ANIMAL RESCUE
- ALARM *
- ALARM *
- ALARM *
- ALARM *
- ASSIST EXTREME WEATHER
- RESCUE ROAD *
- RESCUE ROAD *
- RESCUE ROAD *
- RESCUE ROAD *
- RESCUE WATER ALL TYPES

Fire Direction

- Fire E
- Fire N
- Fire NE
- Fire NW
- Fire S
- Fire SE
- Fire SW
- Fire W

Fire Points

- Control Centre
- Divisional Boundary
- Evacuation Area
- Fire
- Fire - Point of Origin
- Fire Appliance
- Fire Hot Spot
- General Asset
- Note
- POI
- Refuge Area
- Road Closed
- Sector Boundary
- Spot Fire
- Threatened Asset
- Water Point

Fire Lines

- Access Track
- Back Burn - Completed
- Back Burn - Planned
- Evacuation Route
- Fire Control Line - Completed
- Fire Control Line - Planned
- Fire Edge - Active
- Fire Edge - Predicted
- Powerlines
- Sector Boundary
- LAT Line - Completed
- LAT Line - Planned

Disclaimer: This product has been prepared for Queensland Fire and Emergency Services and Public Safety Business Agency. Other users must satisfy themselves it is accurate and suitable for their purpose. QFES & PSBA does not accept any liability for any loss or damage that may arise from the use of or reliance on this information.

Queensland Government

File F Release

N

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Kilometres

WGS_1984_Web_Mercator_Auxiliary_Sphere

GDA

This map was automatically generated using Geocortex Essentials.

A3 map produced at:
November 22, 2020 9:43:37 AM

Date : 21/10/2020 11:20:32 AM
From : "HEAD Damien"
To : "CAMBOURN Neil"
Subject : FW: Duling CZ Wildfire update 10.33am 21Oct2020
Attachment : image001.jpg;

So you are in the loop too.

Everything exactly as predicted. Now that the wind has gone east and is light back burning is less of an issue if pursued.

From: CUBIS Mick <Mick.Cubis@des.qld.gov.au>
Sent: Wednesday, 21 October 2020 11:17 AM
To: DARGUSCH Marc
Cc: YETMAN Brendon; PALMER Matt; HEAD Damien
Subject: RE: Duling CZ Wildfire update 10.33am 21Oct2020

Thanks for the update Marc, give me a call when you are ready,

thanks

Mick Cubis
Regional Director, Coastal and Islands Region
GBRMCI | QPWS & Partnerships
Department of Environment and Science
P: 07 54471137 M: Personal Info
240 Moorindil Street, Tewantin
Qld 4565
mick.cubis@des.qld.gov.au

From: DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au>
Sent: Wednesday, 21 October 2020 10:44 AM
To: CUBIS Mick
Cc: YETMAN Brendon; PALMER Matt
Subject: Duling CZ Wildfire update 10.33am 21Oct2020

Mick – all things in order at this stage.

James Kuskie/Sven Lavender have now gone off-shift and have briefed Matt Palmer who is the incoming IC for this fire.

Flame link:
https://flame.npsr.qld.gov.au/FLAME/app.aspx?fw_menu=flsall&assocheaddetsde26_k_id=13318488
Flame SitRep:
20.10.20 1730 JRK Fire to the north has minimal activity and very low flame height, fire in the Wathumba swamp area has approx. 2-5m flame height due to swamp area and is burning onto beach. Fire around the Orchid beach town area has slowed in intensity and has not progressed any further towards the town area and is still located 1.2klm south west towards Wathumba creek.
21.10.10 0730 JRK 1 Crew on eastern beach, 2 crews to go to Wathumba CZ to check on CG and road status.

I'm about to leave Dundubara with Shane Fitzpatrick (QPS) to meet up with QFES 1st Officer and QPWS crew at Orchid Beach. I have spoken to Andrew Marnie (QFES) and Russel Stephens-Peacock (QFES modelling expert) with a view to determining what we will be faced with. The below is QFES modelling of fire behaviour indicating state of play at 1700hrs this arvo (21Oct2020). After meeting on-site with 1st Officer in Orchid Beach I will re-contact QFES and they will have a new model picture of fire behaviour for today.

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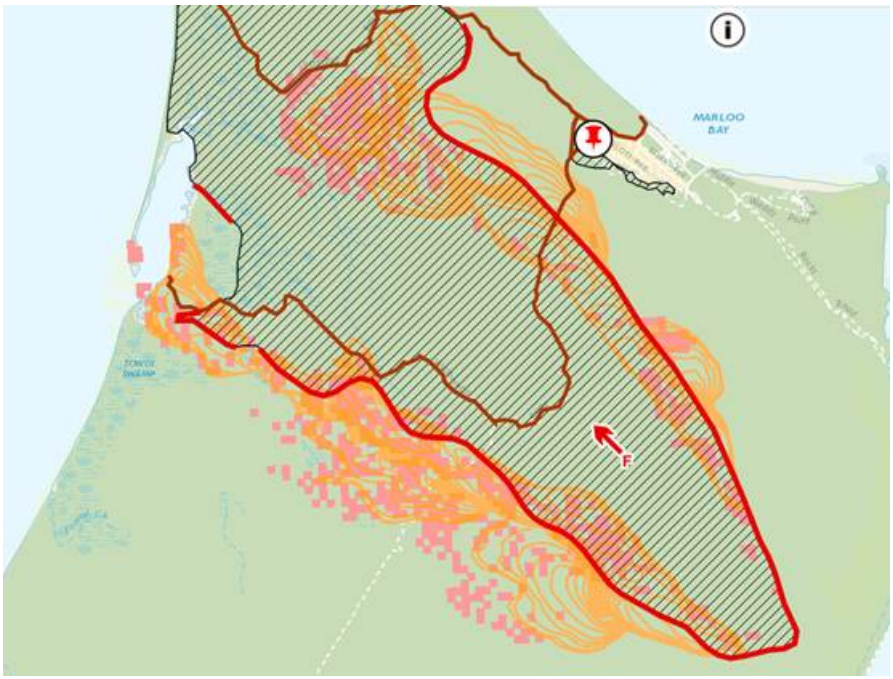

Once I have my head around the above I'll call you with view to gauging our stance on tactics. From that point IMT will work our resourcing needs into future including use of strike team and like.

Anyways, got to go due to tide.

M

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Date : 26/11/2020 9:16:22 AM
From : "HEAD Damien"
To : "HARRIS Leigh"
Subject : FW: Duling update_20201125_1700
Attachment : Situational analysis_ Strategy_Alt1_fire line map.PNG;RE: Duling Wildfire K'Gari 24/11/2020 as at 1230;image001.png;image004.jpg;image003.png;

From: DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au>
Sent: Wednesday, 25 November 2020 5:51 PM
To: HEAD Damien; CUBIS Mick
Cc: CAMBOURN Neil; Corro DES QPWS GBRMCI
Subject: RE: Duling update_20201125_1700

Hi Damien … some thoughts below.

M

From: HEAD Damien <Damien.Head@des.qld.gov.au>
Sent: Wednesday, 25 November 2020 4:57 PM
To: DARGUSCH Marc; CUBIS Mick
Cc: CAMBOURN Neil; Corro DES QPWS GBRMCI
Subject: RE: Duling update_20201125_1700

Marc

Good sit rep and plans info. Thanks to the IMT for these.

Question:
I note your words about burning into the upper reaches of Poyungan (yellow line). All good.
However I note on the map attached there is a line marked along Cornwalls break road out to the eastern beach and dated 26/11/2020. Is there an intention to burn off that as well **Yes** or is that just flagging the mulching work as a precaution? I assume we are only taking our burning operations into the closed forest and the wildfire still remains on the western side only of the closed forest. Is this correct? **At this stage** Apart from the fire near Cathedral there is no fire on the eastern side of the closed forest as yet? **There isn't, but …. It is going to come through multi-fingers to east at some stage unless we get rain … and that has not come since 14Oct2020. If we miss the opportunity to burn off Cornwell's we will then be faced with multi-days of N-NW that are likely to push through to the east and threaten Cornwell's … without a wide blackened edge and without any ability to put one in due to wind conditions. We are then looking at defending Eurong. We need to create a solid fire control line in the south then move back to sorting situations surrounding HV/and other built assets. QFES on board with this plan.**

Damien

From: DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au>
Sent: Wednesday, 25 November 2020 4:35 PM
To: Nalder.MariaJ@police.qld.gov.au; Fitzpatrick.ShaneB@police.qld.gov.au; Mahon.ChrisM@police.qld.gov.au; Clowes.AnthonyJ@police.qld.gov.au; Brendan.Guy@frasercoast.qld.gov.au; GRANT Andrea; YETMAN Brendon; HARVEY Peter; SEELEITHER Jamie; EMBREY Teena; LAWTON Colin; HEAD Damien; CAMBOURN Neil; KLAASSEN Ben; Corro QPWS gbrmci CIR
Cc: CUBIS Mick; CONNOR Nathan
Subject: Duling update_20201125_1700

Hello all – the latest from the IMT.

Regards, Marc

Marc Dargusch
Principal Ranger – Great Sandy Area
Coastal and Islands Region | QPWS and Partnerships
Department of Environment and Science
M Personal in P 07 54869960
Level 6, 12 on First Avenue, Maroochydore 4558
www.des.qld.gov.au

I give my respect to the traditional and custodial Aboriginal and Torres Strait Island Elders and Owners of the Land in which I work, live and walk.

From: CONNOR Nathan <Nathan.Connor@des.qld.gov.au>
Sent: Wednesday, 25 November 2020 4:23 PM
To: Peter.Hollier@qfes.qld.gov.au; DARGUSCH Marc; CUBIS Mick; MCLAUGHLIN Marty; SPINKS Troy
Cc: Brittany Hewson
Subject: Duling update_20201125_1700

Hi Peter and all,

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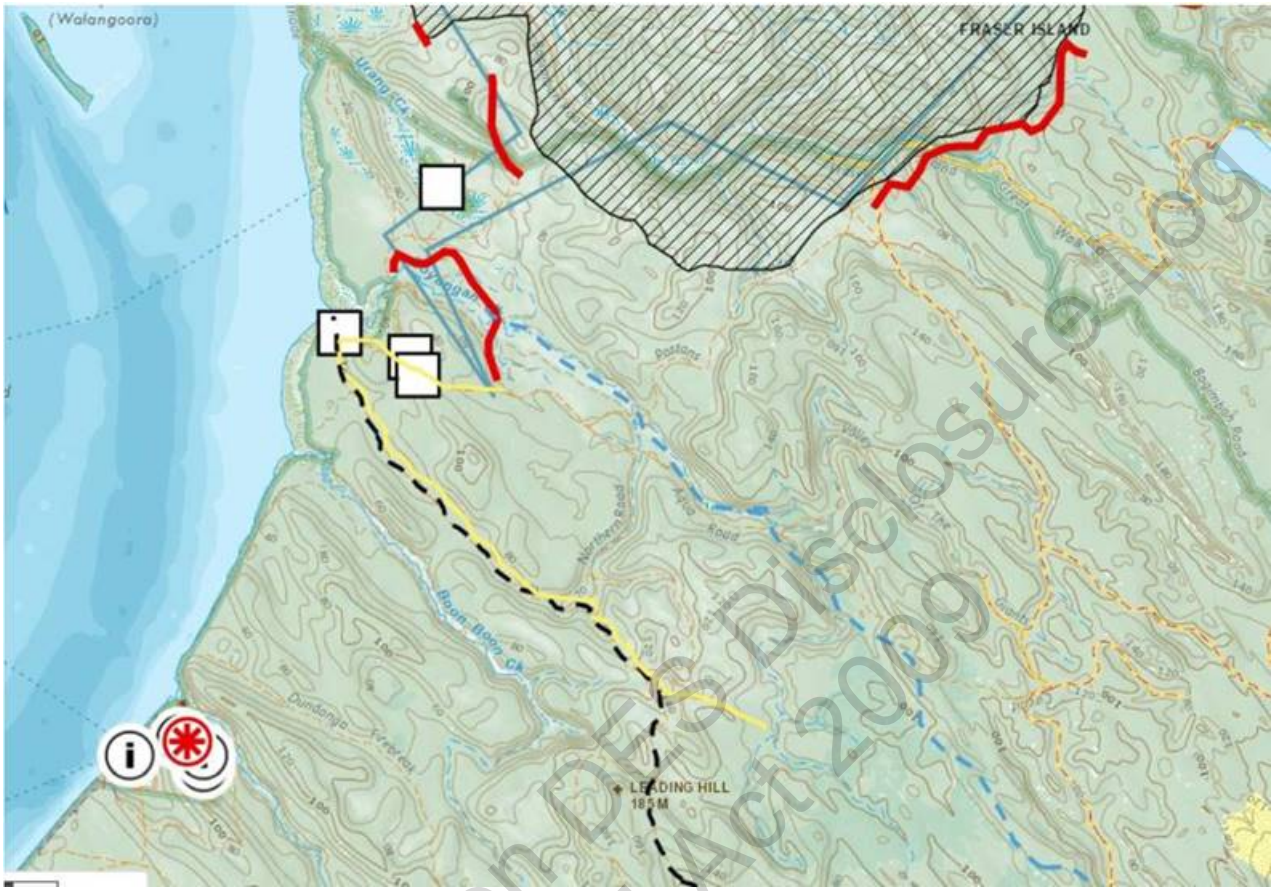
Please note the following updates for Duling Fire;

- Burn out operations to commence (ground operations only) from far northern extent of Smith-Poyungun firebreak in SE direction through to wet area at upper reaches of Poyungun Creek – yellow line on 1st snip.
- Please note that aerial ignition is not required tonight owing to last light issues and visitor management to east. We will look to employ aerial ignition strategy as per attached tomorrow conditions pending – these docs will be updated accordingly.
- Please also see attached Alternative 1 fireline map and Situation Analysis options doc. These will be updated for tomorrow morning.
- We will also provide fall back options for your information tomorrow am.



Nathan Connor
Principal Conservation Officer – Fire Management
Technical Services
Queensland Parks and Wildlife Service
Department of Environment and Science
M Personal inf

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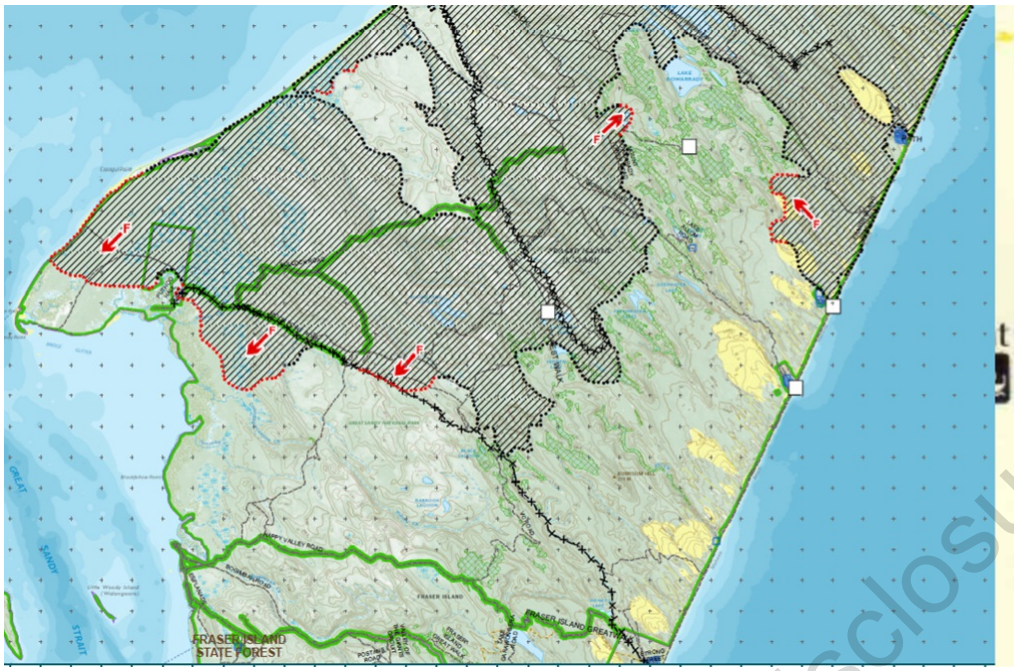
Date : 24/11/2020 2:01:34 PM
From : "CAMBOURN Neil"
To : "HEAD Damien" , "DARGUSCH Marc" , "CUBIS Mick"
Subject : RE: Duling Wildfire K'Gari 24/11/2020 as at 1230
Attachment : image001.png;image004.jpg;image006.jpg;image002.png;image003.png;image007.png;image010.png;

I think the modelling is incorrect.
If we overlay the veg map to the fire map, it's clear to see it has pulled up at the rainforest line, so will not get to Happy Valley on current trajectory in my view.
The line follows exactly that wetter veg line map to map.



Neil Cambourn
Assistant Director-General
Queensland Parks and Wildlife Service and Partnerships
Department of Environment and Science
P 07 3199 7518 M [redacted]
Level 5, 400 George Street, Brisbane QLD 4000

From: HEAD Damien <Damien.Head@des.qld.gov.au>
Sent: Tuesday, 24 November 2020 1:38 PM
To: DARGUSCH Marc; CUBIS Mick; CAMBOURN Neil
Subject: RE: Duling Wildfire K'Gari 24/11/2020 as at 1230

Marc

Question. Looking at the assumption of the modelling. Is there consideration to the vegetation type in there? That is some pretty aggressive modelling along an edge that hasn't progressed much over the past 7 days. All the fires movement has largely been to the south

---

From: DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au>
Sent: Tuesday, 24 November 2020 1:32 PM
To: HEAD Damien; CUBIS Mick; CAMBOURN Neil
Subject: FW: Duling Wildfire K'Gari 24/11/2020 as at 1230

Hi Mick/Damien/Neil - Situation @ 1300hrs 20201124:

- The main fire continues to move in a south easterly direction with poor fire weather conditions on the island.
- The community of Happy Valley is potentially under threat within the next 24hrs ***although*** the latest mapping and predictions indicate this threat has abated with an improved forecast. QFES, RFS, QPWS and QPS, Ambulance are working together to prepare the community. It is worth noting that the fire has not yet exited the closed forest into the dryer eastern vegetation types.
- Forecast wind change easterly at about 4.00am 25/11/2020 will further lessen the current risk to Happy Valley.
- Fire to the south has now just over the Boginbah Track.

- Other sectors:
  - Active fire at the north of the island at Sandy Cape sector is being monitored.
  - Cathedral Beach sector is blacking out.

- IMT has relocated and ramped up (refer attached pdf) to Rainbow Beach. Nathan Connor is now the IC.
- Divisional control is operating out of QPWS Dundabara.

Given the fire proximity to Happy Valley (and smaller communities to south including Yidney Rocks etc) + Kingfisher Bay Resort the current QPWS run IMT would be comfortable with QFES taking control if QFES happy to attempt to utilise the Smith-Poyungun Road as the southern control line & have QPWS on IMT with them.

Some fire predictions are contained below.

Regards, Marc

Marc Dargusch
Principal Ranger – Great Sandy Area
Coastal and Islands Region | QPWS and Partnerships
Department of Environment and Science
M [redacted] P 07 54869960
Level 6, 12 on First Avenue, Maroochydore 4558
www.des.qld.gov.au
I give my respect to the traditional and custodial Aboriginal and Torres Strait Island Elders and Owners of the Land in which I work, live and walk.

Predicted fire spread details below as sourced from QFES FBAN imbedded in IMT Rainbow;

Fire spread prediction generated this morning for Fraser Island - Happy Valley.
The image below is for 14:00 hrs today & 0100 hrs Wednesday. The Simulation runs through to 25th November in the attached KMZ file, but this will be revised throughout today as new mapping is made available.

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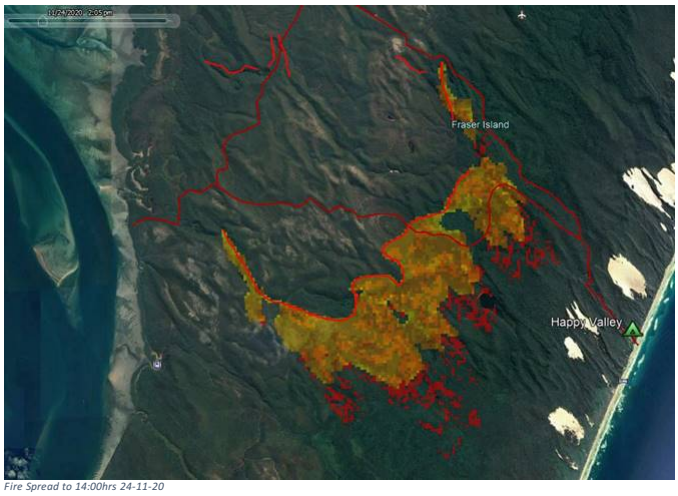

Fire Spread to 14:00hrs 24-11-20

Fire Spread to 0100hrs 25th Nov 2020

Assumptions used to develop this prediction:

- Active fire edge as determined by Air Obs at 08:20hrs 24-11-20 have been used.
- No active fire suppression is being undertaken.
- No additional backburning has been undertaken.
- Phoenix standard inputs have not been adjusted.
- Weather is from BOM grids downloaded this morning.

John Atkinson
Senior Project Officer
Fire Team | Queensland Parks and Wildlife Service
Department of Environment and Science
P 07 4999 8533 | **E** John.Atkinson@des.qld.gov.au
Level 5 | 44 Nelsen Street | Mackay

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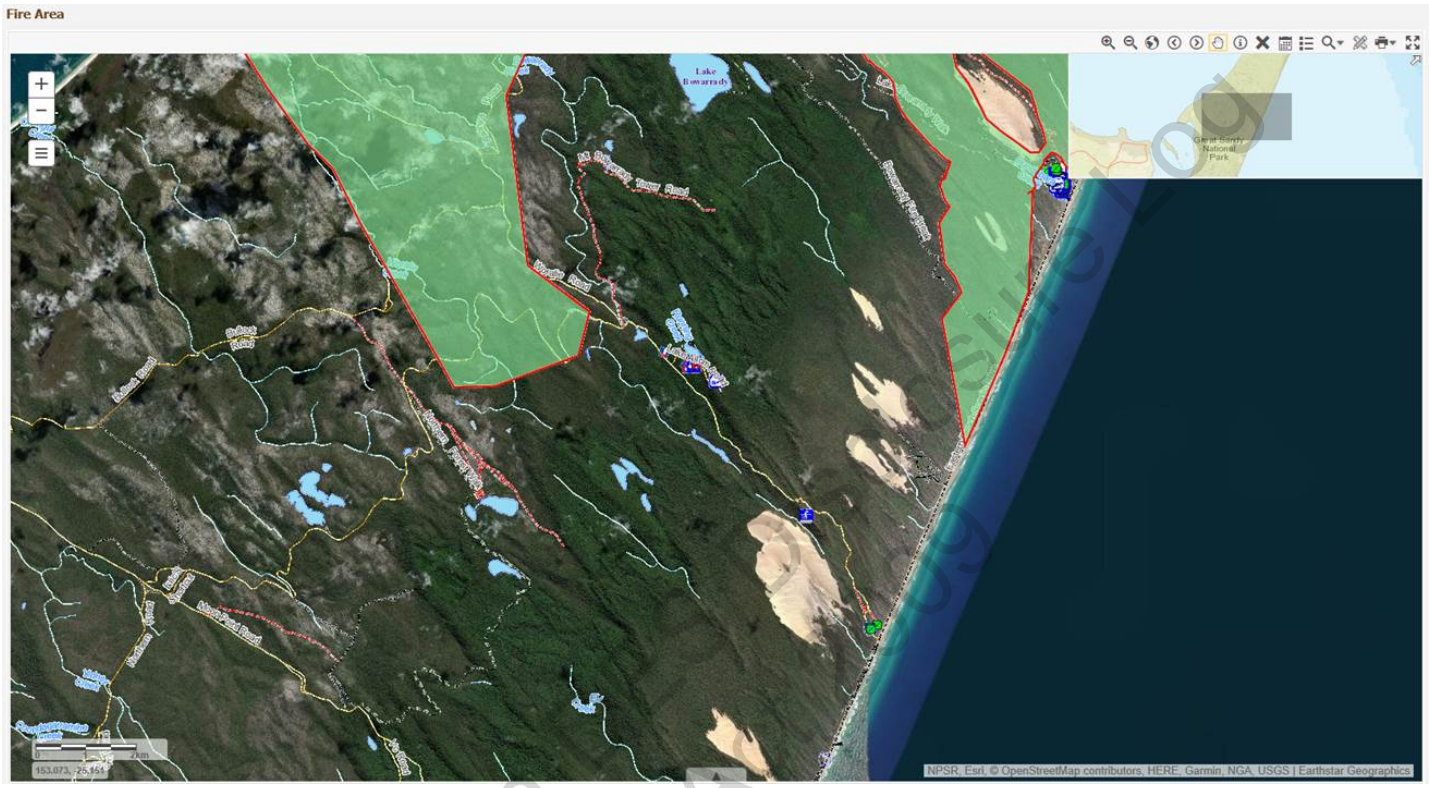
Date : 14/11/2020 3:00:35 PM
From : "HEAD Damien"
To : "CUBIS Mick" , "CAMBOURN Neil"
Subject : FW: Fire of Concern
Attachment : image003.jpg;

I know the burn area in flame is only indicative however it shows well how the fire is now in two parts with the 'wetter core' of the island is now not burning down the island equally. It will be interesting if the fire on the western side has the capacity to burn through the core to the east coast or spot over it. No doubt it is burning with intensity into it. But it would be extremely difficult for it to maintain intensity there are currently seeing if it goes through it.

The fire is moving down the east coast on this wind and it the eastern fire front that they are monitoring for cathedral.

They will be wanting the wind to turn before it reaches the woralie track (road into Lake Allom) so they can do a burn with the wind from the eastern into lake allom to when it gets too wet that it wont hold the burn. That should be the initial focus.

Then turn attention to west coast.



From: Fire Advice <Fire.Advice@des.qld.gov.au>
Sent: Saturday, 14 November 2020 2:33 PM
To: HEAD Damien; CUBIS Mick; DARGUSCH Marc; ALDERSON Tina; ORGILL Dave; SCHAPER Dan; FERGUSON Hayden; MACDONALD Stirling; LESSONS Jay
Cc: HARGREAVES Jack; EDMED Greg
Subject: Fire of Concern

Fire of Concern

As at 14/11/20 02:32, a Fire of Concern has been reported in Flame. Please see Duling for more information.

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Date : 26/11/2020 9:08:41 AM
From : "HEAD Damien"
To : "HARRIS Leigh"
Subject : FW: K'gari camping_zones 2-7 CLOSED due to wildfire

Just extension of what we discussed on the phone. Thanks for the offer of support.

From: DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au>
Sent: Thursday, 26 November 2020 8:21 AM
To: HEAD Damien
Cc: CUBIS Mick
Subject: RE: K'gari camping_zones 2-7 CLOSED due to wildfire

Thanks, this and more on table with IMT.

Ta, M

From: HEAD Damien <Damien.Head@des.qld.gov.au>
Sent: Thursday, 26 November 2020 8:10 AM
To: DARGUSCH Marc; CONNOR Nathan
Cc: CUBIS Mick; CAMBOURN Neil
Subject: Re: K'gari camping_zones 2-7 CLOSED due to wildfire

Marc

That is excellent news. I would really appreciate more consideration to this strategy of utilising the central core as a natural firebreak. Some key points for contemplation from me.

- the central core to this date has held in the face of strong northerly winds and an active fire front that has had a head of steam. If it hasn't penetrated now what gives us the impression it is about to?
- if we feel (after aerial inspection) it is trickling through at a low intensity those small active fire fronts make them prime candidates for direct aerial attack in a southerly wind. If not any wind direction.
- this eastern front and flank of the fire should be the focus any aerial patrol to ensure early detection of flare ups and water bombing.
- should we have faith in this closed forest as a firebreak we significantly reduce the risks of the length of fire line (backburn) we are attempting to manage. Our success to date in managing long burns has been limited.
- a breach by our back burn to the south on the east coast will have eurong in it's immediate path in very quick time. I am not sure we are ready at eurong for such. So waiting, watching and preparing eurong should be needed prior to a burn.
- assuming the backburn is successful along Cornwall break to the east coast and we will have introduced fire onto the east coast and will we will need to 'nurse the burn' all the way north back up to cathedral past the communities at yidney and poyungan. This is likely to significantly extend the campgaign by weeks, potentially unnecessarily and with all the additional risks.
- should we take a more considered position of monitoring the eastern fire flank, attempt direct attack where necessary we at best contain the fire to the west side of the island limiting any impacts upon communities and camping along the east coast. At worst we have given us some time to regather (rest) our resources for a period of time, prepare eurong (for worst case) and know we tried to avoid any unnecessary fire and a risk which would have been created by us.

I see the risks low and the benefits extremely high if we can hold the Eastern flank using the closed forest core of the island and not unnecessarily or prematurely introduce fire to the east coast.

To date the closed forest has had more success in containing and suppressing the fires movements in very bad weather condition more so than ee have had with aerial attack and backburn ing in favourable conditions.

I am not saying we won't have to burn the east coast but let's not be the ones to start it. If it is breached we go again with the Cornwalls strategy.

Please give this strategy some consideration in the IMT.

Damien.

Sent from my iPhone

> On 26 Nov 2020, at 7:30 am, DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au> wrote:
>
> Mick – met with IC. He's going back to IMT and re-engaging with QFES/team about modelling + getting clear definition of current fire location with a view to indicating if central core breached/close to being breached.
>
> He understands timing re:below meet Neil/DG.

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Room to pull back CZ closures Cornwall's to HV by 24hrs due to western light-up being slowed by stronger winds last night. This can allow good decision to be made on the 'core breach' possibilities and in turn, if we should light Cornwall's Rd to secure southern fireline.

M

From: CAMBOURN Neil <Neil.Cambourn@des.qld.gov.au>
Sent: Thursday, 26 November 2020 6:53 AM
To: CUBIS Mick; DARGUSCH Marc
Cc: HEAD Damien; KLAASSEN Ben
Subject: Re: K'gari camping_zones 2-7 CLOSED due to wildfire

Please have this decision reviewed before implementing at campgrounds to the south in line with my discussions with Marc last night around the fire not penetrating the rainforest to date.

Regards Neil Cambourn

> On 26 Nov 2020, at 6:26 am, CAMBOURN Neil <Neil.Cambourn@des.qld.gov.au> wrote:
>
> Please provide the rationale including the modelling that supports this decision Mick. We are at Kedron at 930 with Dg and commissioner and I want to know why we are taking this action so far down the island.
>
> Regards Neil Cambourn
>
> > On 26 Nov 2020, at 5:41 am, CUBIS Mick <Mick.Cubis@des.qld.gov.au> wrote:
> >
> > FYI
> >
> > Mick Cubis
> > Regional Director
> > Coastal and Islands | QPWS&Partnerships
> > Department of Environment and Science
> > P (07) 54471137 | Mobile Personal inf
> >
> > Begin forwarded message:
> >
> > **From:** DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au>
> > **Date:** 26 November 2020 at 4:20:01 am AEST
> > **To:** CUBIS Mick <Mick.Cubis@des.qld.gov.au>
> > **Subject: K'gari camping_zones 2-7 CLOSED due to wildfire**
> >
> > Hi Mick – the below occurred late yesterday to align with IMT advice on fire tactics/fire movement. It will continue to be actioned today to ensure visitor safety.
> >
> > There is not sufficient capacity to move these bookings to alternative locations on the island so the areas were closed to further bookings on the system and work is being done to cancel/refund these bookings. Other options may still be available at other zones on K'gari but we won't be able to cater for all. Cooloola/IPRA are still options for campers.
> >
> > Wanted to get this to you late yesterday but ….. stacks going on in supporting IMT.
> >
> > Regards, Marc
> >
> > ---
> >
> > **From:** BARRACLOUGH Emma <Emma.Barraclough@des.qld.gov.au>
> > **Sent:** Wednesday, 25 November 2020 4:40 PM
> > **To:** HARVEY Louise; DARGUSCH Marc
> > **Cc:** BOWMAN Diane; WRIGHT Michelle; MCRAE Moyra; POWLEY Alicia; ATKINSON John; HARGREAVES Jack; CONNOR Nathan
> > **Subject:** K'gari camping_zones 2-7 CLOSED
> >
> > Hi Marc/Lou,

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Confirming that K'gari camping zones 2-7 have now been closed in the QPWS booking system until 4th December.

- Notifications have been sent out to all bookings for this period.
- Online booking team have been advised.
- Park Alert has been updated to include these zones.
- Conditions Report will also be updated.

Thanks

Emma

Emma Barraclough
A/Assistant Principal Ranger I Technical Support
Coastal and Islands Region / QPWS & Partnerships
Department of Environment and Science

P Personal in
Level 6, 12 First Avenue
MAROOCHYDORE QLD 4558

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Date : 16/11/2020 2:10:36 PM
From : "HEAD Damien"
To : "DARGUSCH Marc" , "CUBIS Mick"
Cc : "CAMBOURN Neil"
Subject : FW: Two K'gari fire interview requests
Attachment : image001.png;image003.png;image002.png;image004.png;

A talking head or someone recording a few minutes to an iphone AM and PM on an update is what is they are after and should suffice all requests.

The enquires are not about to go away as we put smoke over HB and Bundaberg in the coming days.

I have said no to the WIN TV one below.

Ben K has now directly asked that we attend to this increasing pressure for doing media. So we need to craft a low resource solution to appease the media but just as much the anxious public and visitors.

Damien

From: Media DES <Media@des.qld.gov.au>
Sent: Monday, 16 November 2020 1:05 PM
To: HEAD Damien
Cc: Media DES
Subject: Two K'gari fire interview requests

Hi Damien,

We have two interview requests regarding the K'gari fire.

The first one is quite urgent - WIN Sunshine Coast would like an on-camera interview ASAP.

Secondly, ABC Wide Bay would like an on-air interview at 7.15am tomorrow morning.

As anyone free to do these?

Thanks,
Emma

Queensland Government
Visit us on Twitter

Emma O'Connor
Senior Media Officer
Media Unit | Corporate Communications
Department of Environment and Science

P 07 3339 5831 Chat with me on Teams!
E Emma.OConnor@des.qld.gov.au
Level 31, 400 George St, Brisbane
Visit the Environment Media Centre

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Date : 18/10/2020 4:58:23 PM
From : "HEAD Damien"
To : "CAMBOURN Neil"
Subject : Fwd: Duling CZ fire update 8.49am 18Oct2020
Re below

I will keen to discuss with you in the morning.

I am not supportive of waterbombing mainly because you won't put it out in the swamp. And if you could, well the fire isn't that bad to warrant such action. I feel this is a case of people wishing to indulge their profession. Aka 'do something'.

Combatting amber attack is easiest if we don't put more fire on the ground too.

There is only another 36 hours of northerly before the southerly kicks in again and pushes the fire back on itself all away from orchid beach.

My thoughts at this stage.

Sent from my iPhone

Begin forwarded message:

From: CUBIS Mick <Mick.Cubis@des.qld.gov.au>
Date: 18 October 2020 at 3:40:45 pm AEST
To: DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au>
Cc: BARRACLOUGH Emma <Emma.Barraclough@des.qld.gov.au>, EDMED Greg <Greg.Edmed@des.qld.gov.au>, MACDONALD Stirling <Stirling.MacDonald@des.qld.gov.au>, HARVEY Peter <Peter.Harvey@des.qld.gov.au>, HEAD Damien <Damien.Head@des.qld.gov.au>
Subject: Re: Duling CZ fire update 8.49am 18Oct2020

Thanks Marc and all, great work as usual and appreciate the effort. We will need to keep a close eye on the situation and review requirements. Keen to discuss further options regarding the plan going forward.

Mick Cubis
Regional Director
Coastal and Islands | QPWS&Partnerships
Department of Environment and Science
P (07) 54471137 | Mobile Personal infor

On 18 Oct 2020, at 3:21 pm, DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au> wrote:

Hi Mick – In managing the current wildfire situation the following have been put in place:

- Camp zone 8 has been closed to further camping bookings. Note that Camp zone 8 includes Duling CZ (+ cleared of campers); Ocean Lake CZ (+ cleared of campers) and Marloo CZ (some campers still in this zone as it is outside of the 'burn zone' and should stay that way, although monitoring occurring).
- Wathumba camping area has been closed to further bookings (+ cleared of campers)..
- The Platypus Bay Track and the Wathumba Track have been closed to the public at the Orchid Beach end of both tracks.

The latest work that has been undertaken by the PC Cooloola includes:

- Park Alert processed to reflect closures.
- Wathumba camping area closed to bookings until 18/11/2020
- Wathumba campers 18/10/20 to 02/11/20 sent bulk SMS and emails to advise of closures.
- Wathumba campers for next three days (18-20/10/2020) also contacted verbally by phone to advise closures and discuss options (spreadsheet attached).
- Printed park alert to Sven, Rainbow and Great Sandy Info Centres.

Regards, Marc

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Sent: Sunday, 18 October 2020 2:56 PM
To: DARGUSCH Marc
Cc: HEAD Damien
Subject: Re: Duling CZ fire update 8.49am 18Oct2020

I would think waterbombing with salt water should be reserved for a critical situation, which we aren't at yet.**Agreed.** I know there have been concerns raised previously with the salt impacts on vegetation but I'm not sure how much of an issue this actually is. **It would be very worthwhile if there was a state-wide stance on this as it seems this question only pops up whilst we are in the thick of attempting to fight a wildfire. I'll flag with Stirlo for progress by TS-Fire but, I'm sure we aren't the only region that would ask this question ☺**

As previously mentioned I'm happy to look at options but would need to know costs **A way from this yet** and have some level of certainty of its effectiveness **We will have to rely on feed from QFES RE:effectiveness**, as opposed to relying on the effectiveness of the protection burns around orchid beach. I think your last suggestion is worth exploring, ie they pay for it. **I do too, not sure from their side.**
Thanks

Mick Cubis
Regional Director
Coastal and Islands | QPWS&Partnerships
Department of Environment and Science
P (07) 54471137 | Mobile Personal inf

> On 18 Oct 2020, at 11:50 am, DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au> wrote:
>
> No probs Mick.
>
> I've engaged with both SR K'gari and QFES in detail this morning. Plenty of digging going on within both teams to come up with successional planning to deal with wildfire in a way that meets both party's needs. This will come together later this arvo as we will then be able to tip greater knowledge of fire behaviour under northerly influence.
>
> One point that came out of my interaction with QFES:
>
> - QFES wanting us to consider use of waterbombing fixed wing aircraft (salt capable). I said I would run this past you to gauge Exec thoughts re:cost/environment/cultural issues.
> - The air resources (referred to above) are currently sitting at Toowoomba but could be put on stb. at Hervey Bay Airport.
> - I'm not sure that we need this level of resource given the good preparatory work around Orchid Beach township but …… QFES have flagged concern about ember attack of Orchid Beach township
> - QFES intend reviewing Orchid Beach situation PM today with a liaison officer to visit.
>
> Any advice from your side good in prep for incorporation in planning. No indicative costs as yet but, it will be expensive. Also, our line could be, we don't believe it is required but ….. happy for QFES to engage (and fund) as back-up.
>
> Regards, Marc
>
> ---
>
> **From:** CUBIS Mick <Mick.Cubis@des.qld.gov.au>
> **Sent:** Sunday, 18 October 2020 11:42 AM
> **To:** DARGUSCH Marc
> **Subject:** Re: Duling CZ fire update 8.49am 18Oct2020
>
> Thanks Marc, appreciate the update.
>
> Sent from my iPhone
>
> > On 18 Oct 2020, at 9:01 am, DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au> wrote:
> >
> > Hi Mick – A bit of an update:
> >
> > Current situation:

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- NAFI indicates that the fire that breached the Platypus Bay line is still in the northern end of the block that has Wathumba Road as its southern boundary.
- We are essentially in a wait and watch phase whilst we have a northerly influence and will be keeping a close eye on fire behaviour especially relating to its rate-of-spread to south.
- There is no immediate threat to life/property.
    - Wathumba campground has been emptied (I will confirm status at Teams Meet referred to below).
    - Even if the fire jumps to the south of Wathumba Road, the township of Orchid Beach has been well prepared by earlier protection burns.

Planning:

- I've talked with SR and Rural FB 1st Officer.
- I'll be having a Teams Meet with SR/QPWS crew this morning.
- I will interact with QFES (Andrew Marnie) post the above.

Regards, Marc

<image001.png>

From: Andrew Marnie <Andrew.Marnie@qfes.qld.gov.au>
Sent: Saturday, 17 October 2020 9:11 PM
To: DARGUSCH Marc
Cc: DARGUSCH Anthony; CIR Fire Team; LAVENDER Sven; KUSKIE James; HARVEY Peter
Subject: RE: Sit rep 1630 Duling CZ fire

Thanks Marc

Will catch up in the morning

Cheers

Andrew

Andrew Marnie
Acting Inspector
Area Director Maryborough

Personal infor

<image003.jpg>

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From: DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au>
Sent: Saturday, 17 October 2020 8:00 PM
To: Andrew Marnie <Andrew.Marnie@qfes.qld.gov.au>
Cc: DARGUSCH Anthony <Anthony.Dargusch@des.qld.gov.au>; CIR Fire Team <CIR.fireteam@des.qld.gov.au>; LAVENDER Sven <Sven.Lavender@des.qld.gov.au>; KUSKIE James <James.Kuskie@des.qld.gov.au>; HARVEY Peter <Peter.Harvey@des.qld.gov.au>
Subject: RE: Sit rep 1630 Duling CZ fire

Hello Pete – I'll call you about 8.15 tomorrow to review where we are at. Thanks to all on fireline for effort to date.

Hi Andrew – We'll review the bit in yellow first up tomorrow although it is likely that we will continue as per below.

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Regards, Marc

<image005.png>

Marc Dargusch
Principal Ranger – Great Sandy Area
Coastal and Islands Region | QPWS and Partnerships
Department of Environment and Science
M Personal in **P** 07 54869960
Level 6, 12 on First Avenue, Maroochydore 4558
www.des.qld.gov.au
I give my respect to the traditional and custodial Aboriginal and Torres Strait Island Elders and Owners of the Land in which I work, live and walk.

From: KUSKIE James <James.Kuskie@des.qld.gov.au>
Sent: Saturday, 17 October 2020 5:02 PM
To: DARGUSCH Marc; HARVEY Peter
Cc: DARGUSCH Anthony; Andrew.Marnie@qfes.qld.gov.au; CIR Fire Team; LAVENDER Sven
Subject: Sit rep 1630 Duling CZ fire

Sitrep for 1630

Planned back burning this morning started well with light Eastery winds but has history has shown the Island makes its own.

Light up at 0830am was Temp 28 deg Hum 50% Wind E at 5kph
1030am Temp 29 deg Hum 40% wind variable 10kph

At 1030 spot over was called and all lighting stopped. Crews were able to contain 2 spot overs but the one in the Wathumba swamp was to big to contain.

All crews fell back to corner of Playtapus road and regrouped.

Fall back was Wathumba Road so cleared all campers out of area. Tractor has cleared around infrastructure. Signage has been placed over Platypus road and Wathumba for road closed.

Fire has reached N side of Ocean lake road but stopped on track edge

With the N winds predicted tomorrow we will have one QPWS unit on eastern beach and 2 QPWS units patrolling the block and watching the fires behaviour.

Plan for future is with the SE winds predicted for Monday night to monitor the situation and make a decision Monday whether to light the south Eastern corner of Wathumba block to keep the fire restrained inside the area.

Thanks.

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Date : 12/11/2020 8:45:06 AM
From : "HEAD Damien"
To : "CAMBOURN Neil"
Subject : Fwd: Request for air support for Fraser Island
Attachment : image004.png;image001.jpg;

Sent from my iPhone

Begin forwarded message:

From: CUBIS Mick <Mick.Cubis@des.qld.gov.au>
Date: 12 November 2020 at 8:41:03 am AEST
To: HEAD Damien <Damien.Head@des.qld.gov.au>
Subject: FW: Request for air support for Fraser Island

fyi

Mick Cubis
Regional Director, Coastal and Islands Region
GBRMCI | QPWS & Partnerships
Department of Environment and Science
P: 07 54471137 M: Personal inf
240 Moorindil Street, Tewantin
Qld 4565
mick.cubis@des.qld.gov.au

From: DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au>
Sent: Thursday, 12 November 2020 8:37 AM
To: Michael Koch
Cc: CUBIS Mick
Subject: RE: Request for air support for Fraser Island

Hello Michael – QPWS are not prepared to fund Options 1 or 2. If QFES determine that 'life & property' are significantly threatened then QFES will need to fund Option 1.

QPWS will continue to work with QFES to ensure relevant landholders are prepared for a wildfire event and that adequate plans are in place to protect life and property.

Regards, Marc

Marc Dargusch
Principal Ranger – Great Sandy Area
Coastal and Islands Region | QPWS and Partnerships
Department of Environment and Science
M Personal inf P 07 54869960
Level 6, 12 on First Avenue, Maroochydore 4558
www.des.qld.gov.au
I give my respect to the traditional and custodial Aboriginal and Torres Strait Island Elders and Owners of the Land in which I work, live and walk.

From: Michael Koch <Michael.Koch@qfes.qld.gov.au>
Sent: Thursday, 12 November 2020 7:13 AM
To: DARGUSCH Marc
Subject: FW: Request for air support for Fraser Island

Michael Koch
Area Director
Rural Fire Service
Maryborough Area Office
Queensland Fire and Emergency Services
M Personal info **P (07) 4122 0337**

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From: Peter Hollier <Peter.Hollier@qfes.qld.gov.au>
Sent: Wednesday, 11 November 2020 6:44 PM
To: Gary McCormack <Gary.McCormack@qfes.qld.gov.au>; Michael Koch <Michael.Koch@qfes.qld.gov.au>; ROC North Coast <ROC.NorthCoast@qfes.qld.gov.au>
Subject: Fwd: Request for air support for Fraser Island

Gary

Michael is seeking endorsement and support to the described approach to managing the suppression of the ongoing fire activity on Fraser Island.

If your supportive I will send through to the State Aire Dest for submission at State Level

Regards

Peter

Peter Hollier
Superintendent
Regional Manager
North Coast Region, Rural Fire Service
Queensland Fire and Emergency Services
Phone: (07) 4122 0330

From: Michael Koch <Michael.Koch@qfes.qld.gov.au>
Sent: Wednesday, November 11, 2020 6:36:27 PM
To: Peter Hollier <Peter.Hollier@qfes.qld.gov.au>; rfsq northcoast <rfsq.northcoast@qfes.qld.gov.au>
Subject: Request for air support for Fraser Island

Peter

As discussed

- Local QPWS staff have requested QPWS executive consider supporting a sustained air attack on the fires burning to the south on Fraser Island
- State Air Desk have provided indicative costs for QPWS to consider
- The costs are high (~$200,000+ not including air attack platform/crew accommodation etc) and should be borne by QPWS however I suggest that QFES give consideration to support the operation if QPWS proceed.
- I recommend QFES help to offset the costs by paying for air attack platform costs and administrative costs (crew accommodation etc) estimated at ~$30,000 for the aircraft and ~$3000 for accommodation etc
- With the recent rains on FI the plan to back burn from a strategic control line is now not an option
- The forecast Northerly change will push the fire further to the south
- There are limited opportunities/effective containment lines to the south
- Crews will be required to undertake asset protection
- The fire will further impact on Fraser Island tourism/economy/environment.

I have attached some supporting documentation for your comments please (tomorrow)

thanks

Michael Koch
Area Director
Rural Fire Service
Maryborough Area Office
Queensland Fire and Emergency Services
M Personal info **P (07) 4122 0337**

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Date : 14/11/2020 11:11:00 PM
From : "HEAD Damien"
To : "CAMBOURN Neil" , "CUBIS Mick" , "KLAASSEN Ben"
Cc : "DARGUSCH Marc"
Subject : Kgari Widlfire Sit Rep - 14/11/2020
Attachment : QPWS_A3_20201114_1400_Great Sandy National Park.pdf;IF 00 15 00 - Situation Report - 2020 Nov 14 1730.docx;image001.jpg;

Ben
As requested and for on forwarding to DG. Information gleaned from more detailed sit reps and discussions with IMT members.

As at 1700 hrs on 14/11/2020

Anticipated to be minimal change before morning

Points of Note

- The wildfire presents no immediate threat to life or property. No property lost to date.
- As a precaution campers and guests of Cathedral Village (a small private beach front camping and accommodation area) have been asked to vacate.
- National park roads and campgrounds effected by the fire and in the path of the active fire fronts have been closed.
- The majority of the island, including all major tourist destinations and townships, remain open to campers, visitors and residents.
- Intense smoke will persists, and will continue to effect island and adjacent mainland communities for the foreseeable future.

Fire Activity (refer map)

- Over the previous 24 hour period the active South East fire front has only advanced 300 m approx. and is located 1.2 kilometres to the north of Cathedral Beach Camping/Accommodation Area. This is significantly less than was expected.
- The Western fire has moved approx. 2 kilometres in a SSW Direction today towards the township of Happy Valley compared to a 7 k run over the previous night. Despite its intensity this active fire front currently poses no threat as it remains a substantial distance from the township.
- An active firefront exists on the northern tip of the island in proximity to the Sandy Cape lighthouse.
- The firefronts are being driven by a northerly wind which is forecast to continue through until Wednesday.
- The active fire fronts are producing significant amounts of smoke which are affecting island visitors and campers and the mainland communities to the south (e.g. Rainbow Beach). Smoke will continue to persist over the island and effect communities south and west (Rainbow Beach to Hervey Bay) for the foreseeable future.

Tactics

- Preparation works have been undertaken around Cathedral village with firelines cleared and widened in preparation for future burning operations when favourable weather conditions present or when the fire is in closer proximity to the area. Given current rate of spread this may not occur for another 48 hours.
- The active western fire front, while continuing to burn with greater intensity, remains a considerable distance away from any life and property and will continued to be monitored.
- Preparatory works will continue on fire lines and private properties around Happy Valley and towards the island's west coast.
- Briefings to inform Happy Valley residents of the fires movements are planned to take place.
- The southerly wind change forecast to move through on the Wednesday will present an opportunity to commence back burning operations under favourable conditions and establish containment lines across the island and hazard reduction burns around vulnerable townships (if necessary).

Resources Deployed

- QPWS (14 personnel and 7 vehicles) and QFES (10 personnel and 4 vehicles) on site.
- Water bombers remain on standby
- QPS officers on-site to assist with directions to members of the public.
- Aerial surveillance of the fire fronts is occurring regularly

Fire History

- The wildlife started from an disbanded illegal campfire north of Orchid Beach for four weeks ago. The offenders have not been identified.
- Approximately ◆ to 1/3 of the island has been burnt at varying intensities due to this wildfire.

Modelling
24 hour simulation through to midnight 15/11/2020.

Phoenix 24 hour screenshot showing potential spread through to midnight 15/11/2020 with a potential contribution to the fire size of 1156 hectares.

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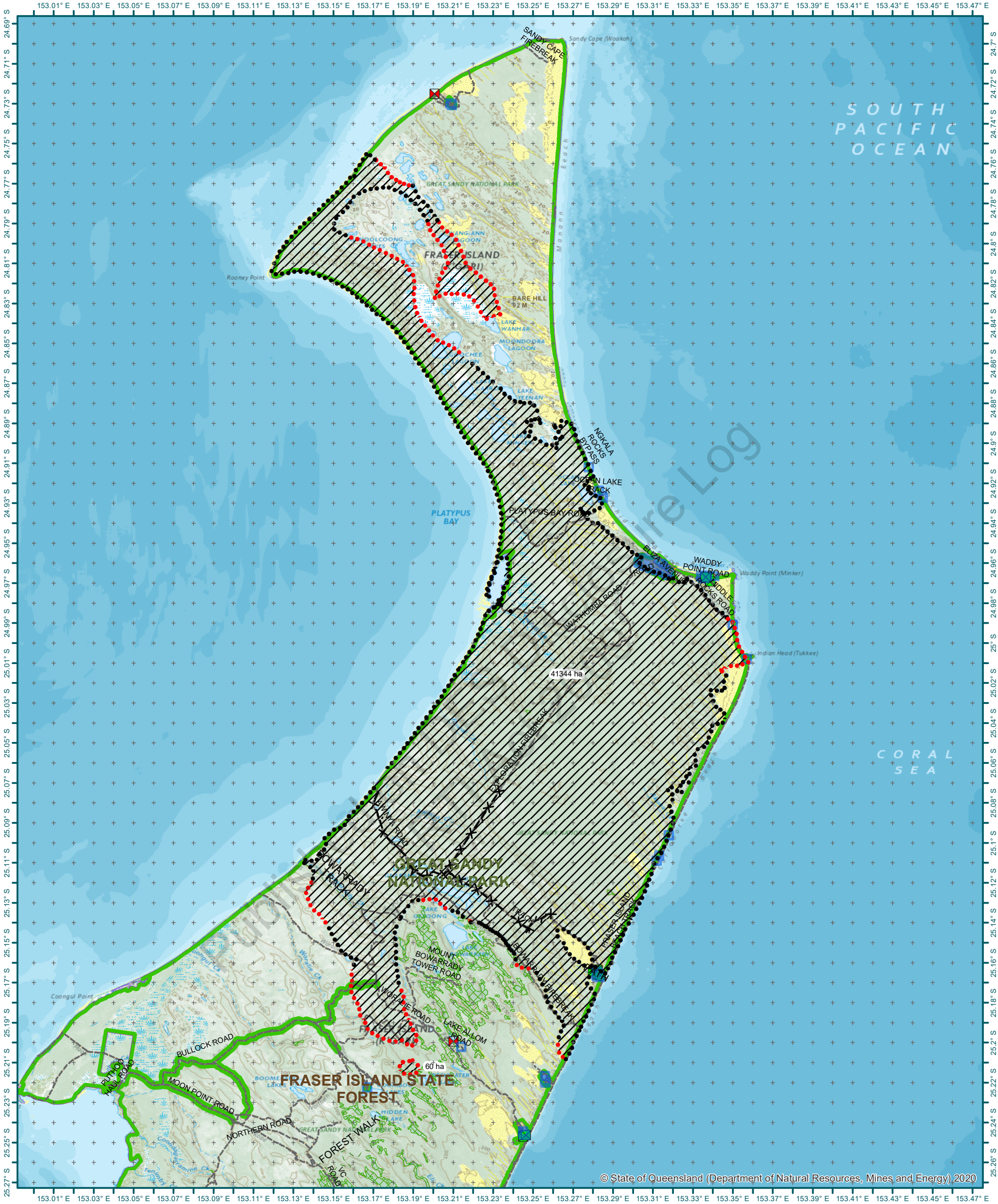

FIRE ACTION MAP

Great Sandy National Park

VIIRS imagery 14/11/2020 1300hrs, MICA data 13/11/2020 1100hrs

Edition: November 2020

Legend

- Fire Control Line - Planned
- Fire Edge - Active
- Fire Edge - Inactive
- Burnt Area - Current
- Qld Building Points

Baseline roads and tracks Queensland

- Streets
- 4WD and tracks
- Ferry

- Bikeways / Walkways
- Gate, Unlocked/Unclassified
- Gate, Locked
- QPWS estate

Fire Regime Groups - Southeast Queensland

- Rainforests

20-206

File F Release

N

1:200,000

At A3

3 0 3

Kilometres

Date: 14/11/2020
Time: 2:33:29 PM

Coordinate System: GCS GDA 1994
Horizontal Datum: GDA 1994

CAUTION
For all practical purposes the GDA 94 datum is the same as WGS 84. When using Global Positioning Systems (GPS) in conjunction with this map the GPS datum must be set to GDA.

Queensland Government

Queensland Parks and Wildlife Service, Department of Environment and Science.

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MAP PRODUCTION: Fire_Template_Portrait_A3_20201114 (HoolihD).

IF 00.15.00

SITUATION REPORT

* **INCIDENT NAME:** K'Gari (Fraser Island) Fire	* **TIME OF CALL:** 0830
	* **FIRECALL NO.:** Q4-20-116117
PLANNING **Mandatory Fields*	* **LOCATION:** Dundabura QPWS Office
	* MAP REF:

S

Update as at 1700 14 Nov 2020

The SE fire has advanced 300 m approx. kilometre south today and is now located 1.2 kilometres to the North of Cathedral Beach Camping/Accommodation Area. This is significantly less than was expected.

The Western fire has moved approx. 2 kilometres in a SSW Direction today towards Happy Valley compared to a 7 k run over the previous night.

Weather

BOM IWD is attached.

Fire is expected to continue to move SSW over the next 24 – 48 hours.

Cathedral Beach

- Planning is underway to commence backburning around Cathedral Beach as conditions calm this evening

K'Gari Camping Area

- QFES LO conducted a recce this

Happy Valley

- Twice daily air obs mapping has been requested for Sunday and Monday to allow ICC to be better informed on ROS and fire movement for potential impact on Happy Valley
- PSU are also using twice daily mapping to better ground truth the inputs for their Fire Predictions
- The immediate threat to Happy Valley has eased but the potential impact continues to monitored closely by the ICC

OFFENSIVE ☐

DEFENSIVE ☐

MARGINAL ☐

M

INCIDENT OBJECTIVES

To control the fire and protect Cathedral Beach, K'Gari and Happy Valley

E

* INCIDENT ACTIONS

0800 14 Nov 2020

QFES Personnel at ICC and Staging:

ICC – 2

Cathedral Beach - 8

Fire is not sectorized.

Cathedral Beach

- Tasking
  - To defend against ember attack if required
  - To support QPWS operations as requested
  - To maintain a presence in Cathedral Beach
- Appliances
  - River Heads 41
  - East Booyal 41
  - Happy Valley 51
  - North Coast 53 (based at Happy Valley)

* RESOURCE SUMMARY

W	ALLOCATED	AVAILABLE
Personnel	10	0
Combatant vehicles	4	
Aircraft (FW/R)		
Plant		
Support	1	
Others		

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Community Engagement

- Managers of Cathedral Beach complex regularly engaged by phone and in person
- QPWS have agreed to planning for their conducting a community meeting at Happy Valley supported by QFES. Date and time to be determined by fire movement over next 24 hours

QPS – QPS are being updated regularly by email and phone as well as visiting the ICC twice daily

PROJECTED QFES RESOURCE COMMITMENT TIME	HOURS	DAYS 5

A

KEY INCIDENT LOCATIONS		CONTACT	MAP REF.
*(CP) ☐ (ICC) X☒	QPWS Office Dundaburra	Andrew Marnie	
Cathedral Beach			
Evacuation Point	N/A		

Comments:

C

* INCIDENT CONTROLLER / QFES COMMANDER	OPERATIONS	PLANNING	LOGISTICS	SAFETY ADVISOR
QPWS Sven Lavender				

S

*COMMUNITY IMPACT	AT RISK	LOST	SAVED	INCIDENT PERSONNEL		COMMUNITY MEMBERS
AREA				INJURIES		
BUILDINGS				DEATHS		
VEHICLES				RESCUES		
ENVIRONMENTAL				MISSING		
FENCING				EVACUEES		
STOCK						

Comments:

GENERAL COMMENTS (Include relevant information not covered above)

Helitak Operations – Cathedral Beach Helipad IS NOT Suitable for 214B Collar tank operations due to size 20 metres in diameter and limited approach departure angles.

Evacuation of Cathedral Beach

- **Voluntary Relocation**
  - Campground is closed
  - Jack Worcester is remaining on site to assist crews with local infrastructure knowledge and is a former member of Benogin RFB, SER.
- **Pippies Backpackers Sub-Lease** – following a visit by QPS the two gentleman were happy to relocate

PREPARED BY: BSO A MARNIE		APPROVED BY:	
TIME: 1730	DATE: 14/11/2010	QFES LO	
NEXT SITREP DUE:		TIME:	DATE:

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Date : 20/11/2020 12:01:16 PM
From : "HEAD Damien"
To : "CUBIS Mick"
Subject : RE: 0900 Sit Rep
Attachment : image001.jpg;

I think that is a good plan. Now is the time. Everything is in their favour. All back burning ops will be with the wind and coming off having a little moisture.

From: CUBIS Mick <Mick.Cubis@des.qld.gov.au>
Sent: Friday, 20 November 2020 11:32 AM
To: KLAASSEN Ben; HEAD Damien; CAMBOURN Neil
Cc: DAVIES Matt; DARGUSCH Marc
Subject: FW: 0900 Sit Rep

Hi all, sitrep attached.

Main focus for today is:

South-west (Moon Point - Yidney Scrub):
Maintain/keep fire north of Moon Point Road.
Reduce current fire activity north of Moon Point road with Rotary Aircraft water bomber .
Strengthen Moon Point firebreak with machinery contractors Significant cultural informati
Implement back burn along Moon Pt Road from Puthoo Haul Road to tie off point within Yidney Scrub. Anticipated to commence this evening and be completed by tomorrow night. Light up will be supported by waterbombing aircraft during daylight hours today and tomorrow.

Also, note waterbombing was conducted yesterday to reduce active fire near Boomerang lakes – this effort extended the Moon Point Road impact time.

Mick Cubis
Regional Director, Coastal and Islands Region
GBRMCI | QPWS & Partnerships
Department of Environment and Science
P: 07 54471137 M: Personal inf
240 Moorindil Street, Tewantin
Qld 4565
mick.cubis@des.qld.gov.au

From: DAVIES Matt <Matt.Davies@des.qld.gov.au>
Sent: Friday, 20 November 2020 11:16 AM
To: CIR Fire Team; DARGUSCH Marc; CUBIS Mick; BLACKMAN Boyd; HARVEY Peter
Cc: DARGUSCH Anthony; TAPPLY Jenna; BULLEY Graeme; Peter.Roberts2@qfes.qld.gov.au
Subject: RE: 0900 Sit Rep

Sorry all.

Here it is.

Matt

Matt Davies
Senior Project Officer – Technical Support
Coastal and Islands Region I Queensland Parks and Wildlife Service
Department of Environment and Science
P (07) 5459 6102 | **M** Personal inf | **E:** matt.davies@des.qld.gov.au
12 First Avenue, Maroochydore Q. 4558

From: DAVIES Matt
Sent: Friday, 20 November 2020 11:02 AM
To: CIR Fire Team; DARGUSCH Marc; CUBIS Mick; BLACKMAN Boyd; HARVEY Peter
Cc: DARGUSCH Anthony; TAPPLY Jenna; BULLEY Graeme; Peter.Roberts2@qfes.qld.gov.au
Subject: 0900 Sit Rep

Hi all,

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0900 Sit Rep from Duling WF.

Matt

Matt Davies
Senior Project Officer – Technical Support
Coastal and Islands Region I Queensland Parks and Wildlife Service
Department of Environment and Science
P (07) 5459 6102 | **M** Personal Info | **E:** matt.davies@des.qld.gov.au
12 First Avenue, Maroochydore Q. 4558

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QUEENSLAND
PARKS AND WILDLIFE SERVICE
File F Release

SITUATION ANALYSIS - BACKGROUND & OBJECTIVES

Form ICS 2

Incident Name:	Date Prepared	Time Prepared	Prepared By:
Duling WF	20/11/2020	09.00 hrs	Matt Davies

Values at Risk:

Built assets south of the current fire area (Kingfisher Bay Resort and Village, Happy Valley Township, K'gari, Yidney Rocks & Poyungan Valley private accommodation, Eurong Township, Dilli Village, Central Station).

World heritage listing, RAMSAR wetlands, unique hydrology, unique vegetation communities, vulnerable pattern fens, water mouse and ground parrot habitat.

Cultural heritage values, indigenous and shared (Bogimbah, Postans Camp, Urang log dump, Bellert's Hut).

Constraints & Other Considerations:

Fire has been burning for 5 weeks, burning through previously burnt country (2018/19 burns), already covered more 52,000ha, melaleuca/sedgeland complex on the western side of the island south of Moon Point has potential to wick south towards Kingfisher Resort. South of Moon Point Road last burnt 2006 in places.

Safety Risks & Hazards:

Moon Point Road closed to public west from Lake Garawongera. – Part Alert modified to reflect this.
Sandy Cape Lighthouse precinct closed through Park Alert.
Southern containment line (Moon Point Rd) is established.
Pending future fire behaviour there may be a need to close additional camping areas in the southern part of the island.
K'gari leased camp area: Work has been carried out inside the fenced area to reduce fuel load immediately adjacent to the fence.
Cathedral Beach Resort & camping area secured on the northern edge, further asset protection may be required.

Current Incident Behaviour: as per twice daily sitreps, SABER reports and QFES reports

19/11/20
1130 Active fire near Boomerang Lakes progressing NW with moderate to high intensity. Air support activated to reduce active fire near Boomerang lakes – this effort will extend the Moon Point Road impact time. See current map attached.

20/11/20
Crews to monitor fire behaviour north of Moon Point Road today and continue preparations for backburning operations.

Butchulla representatives have expressed a strong desire to actively participate in all aspects of the fire suppression including supporting IMT roles.

Weather	Temperature	Rel. Humidity	Wind Sp & Dir	Comments
Current - 900hrs	**26**	**61%**	**31k/h ESE**	**Forecast from SABRE Happy Valley K'Gari 20.11.2020**
Projected - 1200 hrs	**29**	**52%**	**26km/h ESE**	
- 1300 hrs	**28**	**53%**	**26km/h ESE**	
- 1400hrs	**27**	**56%**	**25km/h ESE**	
- 1600hrs	**26**	**61%**	**25km/h ESE**	
- 1800hrs	**23**	**70%**	**24km/h ESE**	

Comments & Outlook:

- Machinery contractor progressing east along Moon Pt Road – works expected to be completed by this afternoon.
- 2 fall back lines are prepared south of Moon Point - Bogimbah & Smith / Poyungan Roads.

Sandy Cape : Recent rain has postponed preparation work for asset protection backburn. This will be reconsidered after deteriorating weather forecast for 24th November

Cathedral Beach Resort & camping area secured on the northern edge, containment line established on the southern side for further backburning that is not expected to occur within the next 24-48hrs. 3000L Tanker on site

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Incident Objectives:

Protect life and property on K'Gari (Fraser Island)

South-west (Moon Point - Yidney Scrub):

Maintain/keep fire north of Moon Point Road.

Reduce current fire activity north of Moon Point road with Rotary Aircraft water bomber

Strengthen Moon Point firebreak with machinery contractors Significant cultural information - B

Implement back burn along Moon Pt Road from Puthoo Haul Road to tie off point within Yidney Scrub. Anticipated to commence this evening and be completed by tomorrow night. Light up will be supported by waterbombing aircraft during daylight hours today and tomorrow.

Additional information:

Aerial mapping of entire fire ground occurring today 1100

BAC cultural advisor continuing to work with contractor and QPWS machinery

Extended weather forecast:

Winds to continue from ESE 20 -29k/h from today easing by Sunday 22.11.2020. Slight North influence predicted to begin Sunday night at 2000. NNE winds continue through Monday & **strengthen from the NNW throughout Tuesday 24.11.2020 peaking at 41km/h,** with humidity expected to be lower than 50%. Long range forecast expect to see a SE wind change on Wednesday 25.11.2020.

Approved by IC (signed)**:** **Time** **hrs**

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Date : 22/11/2020 11:50:53 AM
From : "HEAD Damien"
To : "Tony Johnstone"
Cc : "CAMBOURN Neil" , "CUBIS Mick" , "KLAASSEN Ben"
Subject : Re: Cost of Air Craft and Use on K'GARI (FRASER)
Attachment : image001.jpg;

Tony

Thanks for you time this morning. To confirm the QPWS will cover the costs of any requested aerial support. The nature of the aerial support needed will be confirmed through the onground IMT.

Appreciate outlining the costs.

QPWS will continue to evaluate the tactics and monitor their effectiveness to inform the ongoing requirement for aerial support each day.

Regards
dAmien

Sent from my iPhone

On 22 Nov 2020, at 11:41 am, Tony Johnstone <Tony.Johnstone@qfes.qld.gov.au> wrote:

Damien,

Thanks for your time this morning.

For transparency, below is an extract from an email in regards to using air assets on K'GARI (FRASER)

- For the purposes of being able to apply timely application of resources QPWS are happy to allow engagement of high-level air resources if an effective strategy can be determined.
- The area of highest priority/concern is the area south of the Moon Point Track and west of the Northern Road. My understanding is that an ***effective strategy for managing this area is as follows***:
    - Use of LAT + 802 waterbombers/gel to be used where environmental concerns can be addressed.
    - Specific tactics:
        - Squeeze flank northwards from south.
        - Black-out backing fire (to west).
    - Back-up Fireline control work by ground crews.
- ***This is not confirmation that QPWS will pay for the above air resourcing. Payment to be sorted out at a high level between DES and QFES.***

Other areas of concern which are currently a lesser priority than the above are also being adequately managed by the IMT and are listed below:

- Moon Point Road east of the Northern road.
- The area around Cathedrals on Fraser.
- Sandy Cape lighthouse.

As discussed on the phone:

- The Large Air Tanker (LAT) is worth $10,000 per hour plus product . ($700 for Gel)
- 802 Air Tractor (wheels) $3000 per hour
- 802 Fire Boss (803 with floats) $5,500 per hour.

A Fire Boss is more effective if water is close by, they can also pick upsalt water if authorised. 802 will have to be resupplied throuhg an air base, so there can be some delays.
As indicated this morning you are happy for the cost of the aircraft as discribed in the streatgy above to be costed to QPWS.
I have also attcahed acopy of a map that shows the fire which I believ the above stratgy is to be used on.
Any concern splease let me know.

Regards

Tony Johnstone

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Chief Superintendent

Director Regional Coordination Rural Fire Service

Queensland Fire and Emergency Services

P 07 3635 3835 **M** Personal info

<image001.jpg>

Classified as OFFICIAL

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<PrintResult.pdf>

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Date : 18/10/2020 11:50:33 AM
From : "HEAD Damien"
To : "CUBIS Mick"
Cc : "DARGUSCH Marc"
Subject : Re: Duling CZ fire update 8.49am 18Oct2020
Attachment : image001.png;image003.jpg;image005.png;

Appreciate update.

Agree with approach,putting more fire on the ground in any manner is only increasing risk. If orchid is safe The fire will have more conservation benefit if we don't light up. Trust our previous protection burn efforts.

Sent from my iPhone

On 18 Oct 2020, at 11:42 am, CUBIS Mick <Mick.Cubis@des.qld.gov.au> wrote:

Damien, latest update FYI.

Sent from my iPhone

Begin forwarded message:

From: DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au>
Date: 18 October 2020 at 9:01:14 am AEST
To: CUBIS Mick <Mick.Cubis@des.qld.gov.au>
Subject: Duling CZ fire update 8.49am 18Oct2020

Hi Mick – A bit of an update:

Current situation:

- NAFI indicates that the fire that breached the Platypus Bay line is still in the northern end of the block that has Wathumba Road as its southern boundary.
- We are essentially in a wait and watch phase whilst we have a northerly influence and will be keeping a close eye on fire behaviour especially relating to its rate-of-spread to south.
- There is no immediate threat to life/property.
    - Wathumba campground has been emptied (I will confirm status at Teams Meet referred to below).
    - Even if the fire jumps to the south of Wathumba Road, the township of Orchid Beach has been well prepared by earlier protection burns.

Planning:

- I've talked with SR and Rural FB 1st Officer.
- I'll be having a Teams Meet with SR/QPWS crew this morning.
- I will interact with QFES (Andrew Marnie) post the above.

Regards, Marc

<image001.png>

From: Andrew Marnie <Andrew.Marnie@qfes.qld.gov.au>
Sent: Saturday, 17 October 2020 9:11 PM
To: DARGUSCH Marc
Cc: DARGUSCH Anthony; CIR Fire Team; LAVENDER Sven; KUSKIE James; HARVEY Peter
Subject: RE: Sit rep 1630 Duling CZ fire

Thanks Marc

Will catch up in the morning

Cheers

Andrew

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Andrew Marnie
Acting Inspector
Area Director Maryborough

Personal infor

<image003.jpg>

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From: DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au>
Sent: Saturday, 17 October 2020 8:00 PM
To: Andrew Marnie <Andrew.Marnie@qfes.qld.gov.au>
Cc: DARGUSCH Anthony <Anthony.Dargusch@des.qld.gov.au>; CIR Fire Team <CIR.fireteam@des.qld.gov.au>; LAVENDER Sven <Sven.Lavender@des.qld.gov.au>; KUSKIE James <James.Kuskie@des.qld.gov.au>; HARVEY Peter <Peter.Harvey@des.qld.gov.au>
Subject: RE: Sit rep 1630 Duling CZ fire

Hello Pete – I'll call you about 8.15 tomorrow to review where we are at. Thanks to all on fireline for effort to date.

Hi Andrew – We'll review the bit in yellow first up tomorrow although it is likely that we will continue as per below.

Regards, Marc

<image005.png>

Marc Dargusch

Principal Ranger – Great Sandy Area
Coastal and Islands Region | QPWS and Partnerships
Department of Environment and Science

M Personal in **P** 07 54869960
Level 6, 12 on First Avenue, Maroochydore 4558
www.des.qld.gov.au

I give my respect to the traditional and custodial Aboriginal and Torres Strait Island Elders and Owners of the Land in which I work, live and walk.

From: KUSKIE James <James.Kuskie@des.qld.gov.au>
Sent: Saturday, 17 October 2020 5:02 PM
To: DARGUSCH Marc; HARVEY Peter
Cc: DARGUSCH Anthony; Andrew.Marnie@qfes.qld.gov.au; CIR Fire Team; LAVENDER Sven
Subject: Sit rep 1630 Duling CZ fire

Sitrep for 1630

Planned back burning this morning started well with light Eastery winds but has history has shown the Island makes its own.

Light up at 0830am was Temp 28 deg Hum 50% Wind E at 5kph
1030am Temp 29 deg Hum 40% wind variable 10kph

At 1030 spot over was called and all lighting stopped. Crews were able to contain 2 spot overs but the one in the Wathumba swamp was to big to contain.

All crews fell back to corner of Playtapus road and regrouped.

Fall back was Wathumba Road so cleared all campers out of area. Tractor has cleared around infrastructure. Signage has been placed over Platypus road and Wathumba for road closed.

Fire has reached N side of Ocean lake road but stopped on track edge

With the N winds predicted tomorrow we will have one QPWS unit on eastern beach and 2 QPWS units patrolling the

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block and watching the fires behaviour.

Plan for future is with the SE winds predicted for Monday night to monitor the situation and make a decision Monday whether to light the south Eastern corner of Wathumba block to keep the fire restrained inside the area.

Thanks.

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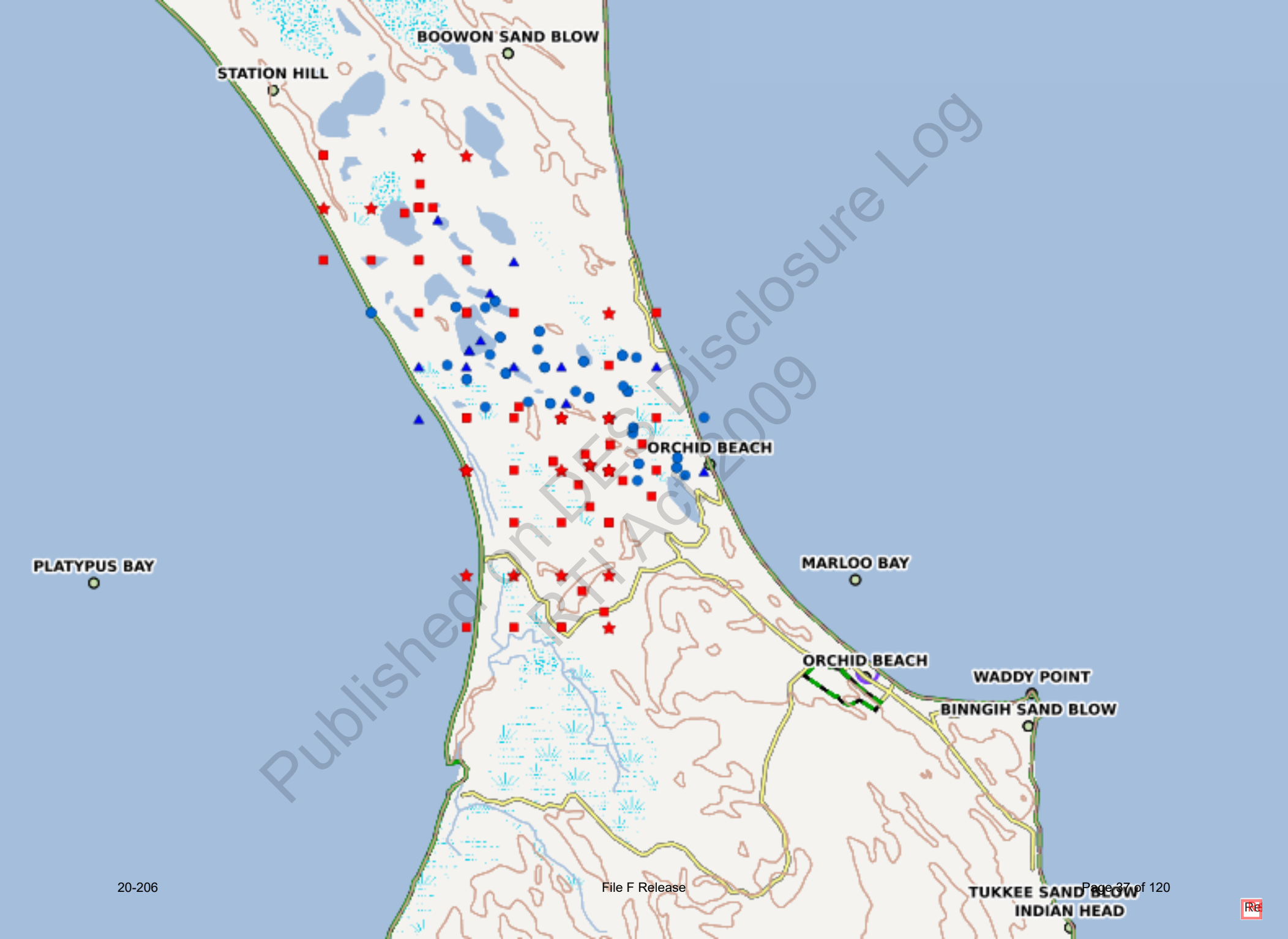

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Date : 10/11/2020 8:49:33 AM
From : "HEAD Damien"
To : "CUBIS Mick"
Subject : RE: Duling CZ WF K'gari - Sunday 9.11.2020 afternoon 16:30:00 SITREP

Yep v good question to ask.

My question would be:

1. What is our objective – containment, suppression, protection of assets XXX?
2. If a backburn is planned for the southern side of the wildfire and the goal is containment of the fire to the north of a break. 100% our backburn will spot south and start a new fire front on a northerly wind. Our history and strike rate confirms we cant hold a backburn if we do not have a favourable wind. Any backburn on the southside of the fire must have a light southerly for a number of days to have any chance of success.
3. I am also always curious on the length of line we intend to back burn. The longer the more our resources are stretched and difficult it is to hold the line. 1km or 5km or 15km . 15km backburn into the wind will take days to deliver and highly risky.

I remain that the only reason we should be lighting up is asset protection around the immediate asset/township and that is only if our protection zones have not been burnt recently. We should let them do their job otherwise.

As the fire moves further south it is about to reach the start of the rainforest in the middle of the island which split the fire in two. One moving down the east coast and one moving down the west coast. These should be factors to consider too. Which they seem too. Easier to manage when you can burn into the rainforest. And only dealing with half the fire threat. West coast is not containable and threatens nothing as it moves south.

Their timing for lighting just before a wind change is difficult to rationalise.

Just my views.

From: CUBIS Mick <Mick.Cubis@des.qld.gov.au>
Sent: Tuesday, 10 November 2020 8:30 AM
To: HEAD Damien
Subject: FW: Duling CZ WF K'gari - Sunday 9.11.2020 afternoon 16:30:00 SITREP

FYI. I've continued to raise concerns about proposal to burn. This proposal highlighted is to light up on Wednesday evening, just as the wind swings from the north and strengthens for the rest of the week. Am I missing something?

Mick Cubis
Regional Director, Coastal and Islands Region
GBRMCI | QPWS & Partnerships
Department of Environment and Science

P: 07 54471137 M: Personal Inf
240 Moorindil Street, Tewantin
Qld 4565
mick.cubis@des.qld.gov.au

From: DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au>
Sent: Tuesday, 10 November 2020 7:36 AM
To: CUBIS Mick
Cc: SEELEITHER Jamie; MACDONALD Stirling; CIR Fire Team; PALMER Matt
Subject: FW: Duling CZ WF K'gari - Sunday 9.11.2020 afternoon 16:30:00 SITREP

Hi Mick – last update on fire. QFES are back on the IMT from 7.30am this morning. Plenty of prep going into Cathedrals/K'gari camp.

IMT will dig deeply into tactics/options for best possible outcomes for Cathedrals/K'gari camp. We've also got eyes on west side of K'gari + Sandy Cape. Some good engage by IMT with QPS/QAS who have been very helpful.

Regards, Marc

From: PALMER Matt <Matt.Palmer@des.qld.gov.au>
Sent: Monday, 9 November 2020 6:01 PM
To: CIR Fire Team; DARGUSCH Marc; HARVEY Peter; YETMAN Brendon; Michael Koch
Cc: LAVENDER Sven; SEELEITHER Jamie; Fitzpatrick.ShaneB[CR]; VurensVanEs.Roland@police.qld.gov.au; TAPPLY Jenna; GREEN John; BEHRENDORFF Linda
Subject: RE: Duling CZ WF K'gari - Sunday 9.11.2020 afternoon 16:30:00 SITREP

Monday 9.11.2020 afternoon 16:00 SITREP

- Winds are as forecasted and predicted to remain S/E – E/SE through till Thursday switching to E/NE to 30km
- Crews monitored fireline around Dundubara and is now blacked out
- 3.5mm of rain over Dundubara Sunday afternoon
- Incoming crews familiarised with fireground and upcoming plans

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- Fire behind Wungul sandblow has progress west and burning moderately during the day, the fire is also burning a backing fire 300 metres from Dundubara Creek.
- Fire is burning south of Awinya Creek in moderate to high intensity along swamp section, both sides of Awinya Road west have burnt with high intensity
- Fire continues to burn behind Tukkee sandblow and south of the Middle rocks in Road
- Water bombing of 15,000l over the Wungul fire should have slowed down the ROS coupled, will be requesting QFES organise aerial mapping tomorrow
- Cat Loader has bare earthed around Cathedrals and will continue to K'gari tomorrow – Update on fire provided to Cathedrals management today
- RFS support will arrive at Dundubara tomorrow to assist IC and team
- Had meeting with QPS+QAS who are assisting with moving campers and providing advice to public
- IC planning for resources for proposed burn on Wednesday evening of the eastern Bowarrady break to rainforest section
- Firecom updated at 12:40 and again at 17:30

IC
Sun-Tues – Matt Palmer
Wed – Sven Lavender

Logistics Support
Jenna Tapply

Ground Crews - Tuesday
1 x NMU
.5 NRM
2 x NSI
1 x Bribie

Incoming crews
Tuesday PM – 1 x Nth Cooloola
Wednesday PM 1 x Manly/Straddie
1 x Ft Lytton
Wednesday – 1 x South K'gari

Matt Palmer
K'gari (Fraser Island) North
Coastal and Islands Region / QPWS & Partnerships
Department of Environment and Science
P 07 4127 9138 M Personal inf
PMB 20, MS 2173 Rainbow Beach QLD 4655

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Date : 21/10/2020 6:14:29 PM
From : "HEAD Damien"
To : "DARGUSCH Marc" , "CUBIS Mick"
Cc : "YETMAN Brendon" , "PALMER Matt" , "HARVEY Peter"
Subject : RE: Duling CZ Wildfire update 10.33am 21Oct2020
Attachment : image001.png;image002.jpg;
Some rain in the forecast too.

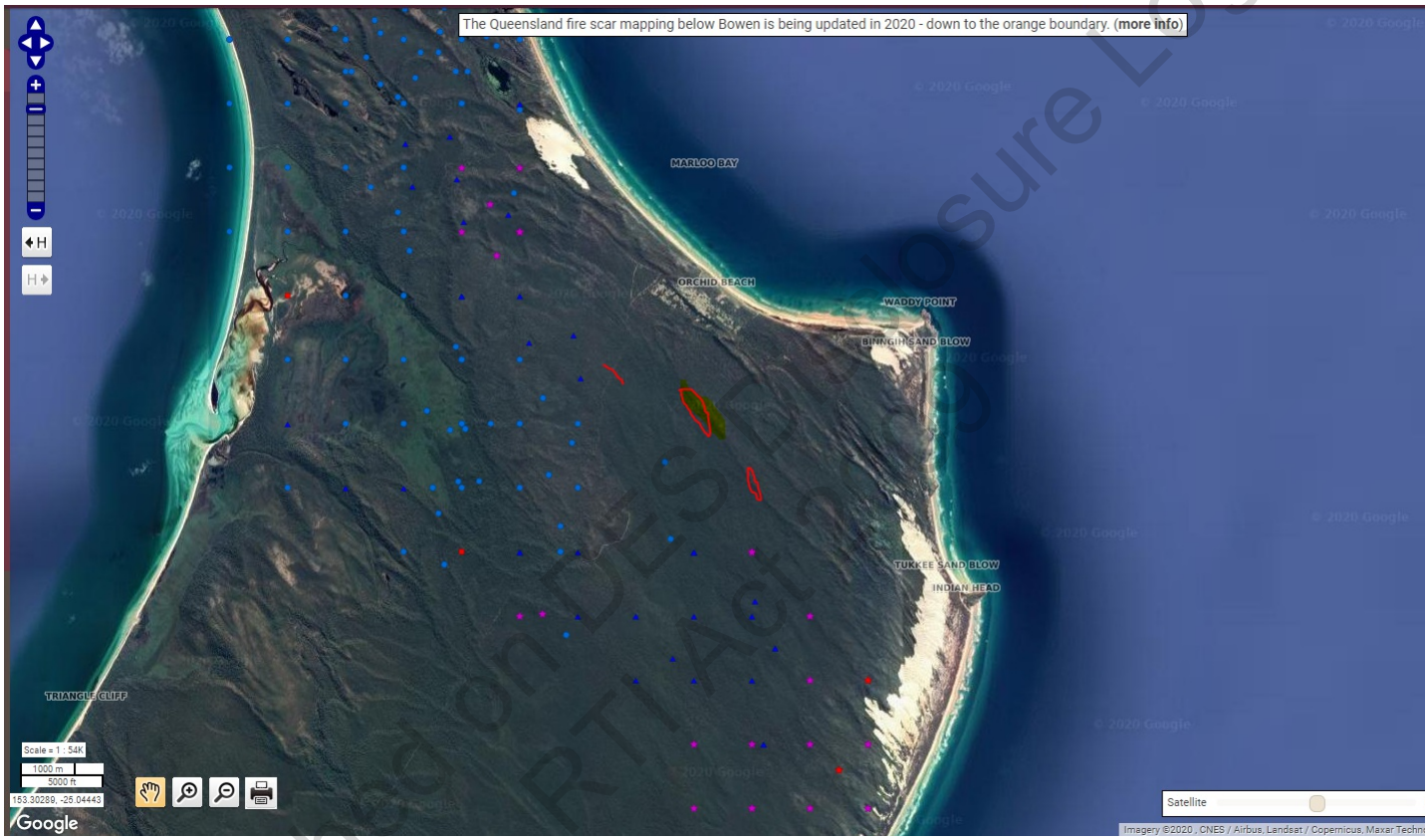
From: DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au>
Sent: Wednesday, 21 October 2020 5:28 PM
To: CUBIS Mick
Cc: YETMAN Brendon; PALMER Matt; HEAD Damien; HARVEY Peter
Subject: RE: Duling CZ Wildfire update 10.33am 21Oct2020

Hi Mick – I've only just got back from K'gari. Things currently looking good on the fire front. I had some great interaction with our local crew, QFES and QPS. There is no rush to make decisions this arvo.

Keen to talk through my thoughts on tactics based on today's interaction + very interested to continue to monitor situation to put against planning. Would like to nail down way forward mid-AM tomorrow so that IMT can have time to put plans in place.

I'll call you 8am tomorrow if that suits you.

Regards, Marc



From: CUBIS Mick <Mick.Cubis@des.qld.gov.au>
Sent: Wednesday, 21 October 2020 11:17 AM
To: DARGUSCH Marc
Cc: YETMAN Brendon; PALMER Matt; HEAD Damien
Subject: RE: Duling CZ Wildfire update 10.33am 21Oct2020

Thanks for the update Marc, give me a call when you are ready,

thanks

Mick Cubis
Regional Director, Coastal and Islands Region
GBRMCI | QPWS & Partnerships
Department of Environment and Science
P: 07 54471137 M: [redacted]
240 Moorindil Street, Tewantin
Qld 4565
mick.cubis@des.qld.gov.au

From: DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au>
Sent: Wednesday, 21 October 2020 10:44 AM
To: CUBIS Mick
Cc: YETMAN Brendon; PALMER Matt
Subject: Duling CZ Wildfire update 10.33am 21Oct2020

Mick – all things in order at this stage.

James Kuskie/Sven Lavender have now gone off-shift and have briefed Matt Palmer who is the incoming IC for this fire.

Flame link:
https://flame.npsr.qld.gov.au/FLAME/app.aspx?fw_menu=flsall&assocheaddetsde26_k_id=13318488
Flame SitRep:
20.10.20 1730 JRK Fire to the north has minimal activity and very low flame height, fire in the Wathumba swamp area has approx. 2-5m flame height due to swamp area and is burning onto beach. Fire around the Orchid beach town area has slowed in intensity and has not progressed any further towards the town area and is still located 1.2klm south west towards Wathumba creek.
21.10.10 0730 JRK 1 Crew on eastern beach, 2 crews to go to Wathumba CZ to check on CG and road status.

I'm about to leave Dundubara with Shane Fitzpatrick (QPS) to meet up with QFES 1st Officer and QPWS crew at Orchid Beach. I have spoken to Andrew Marnie (QFES) and Russel Stephens-Peacock (QFES modelling expert) with a view to determining what we will be faced with. The below is QFES modelling of fire behaviour indicating state of play at 1700hrs this arvo (21Oct2020). After meeting on-site with 1st Officer in Orchid Beach I will re-contact QFES

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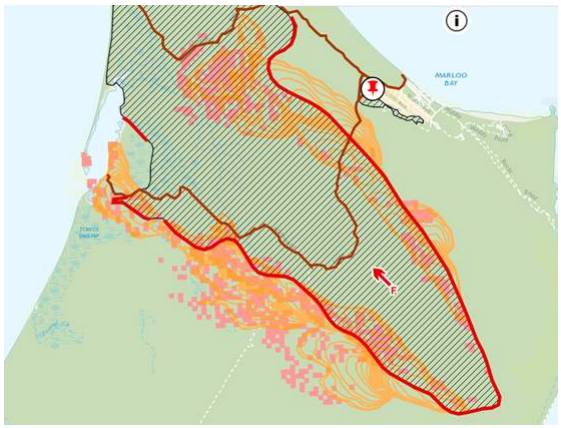
and they will have a new model picture of fire behaviour for today.



Once I have my head around the above I'll call you with view to gauging our stance on tactics. From that point IMT will work our resourcing needs into future including use of strike team and like.

Anyways, got to go due to tide.

M

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Date : 25/11/2020 4:56:33 PM
From : "HEAD Damien"
To : "DARGUSCH Marc" , "CUBIS Mick"
Cc : "CAMBOURN Neil" , "Corro DES QPWS GBRMCI"
Subject : RE: Duling update_20201125_1700
Attachment : Situational analysis_ Strategy_Alt1_fire line map.PNG;image001.png;image004.jpg;image003.png;

Marc

Good sit rep and plans info. Thanks to the IMT for these.

Question:
I note your words about burning into the upper reaches of Poyungan (yellow line). All good.
However I note on the map attached there is a line marked along Cornwalls break road out to the eastern beach and dated 26/11/2020. Is there an intention to burn off that as well or is that just flagging the mulching work as a precaution? I assume we are only taking our burning operations into the closed forest and the wildfire still remains on the western side only of the closed forest. Is this correct? Apart from the fire near Cathedral there is no fire on the eastern side of the closed forest as yet?

Damien

From: DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au>
Sent: Wednesday, 25 November 2020 4:35 PM
To: Nalder.MariaJ@police.qld.gov.au; Fitzpatrick.ShaneB@police.qld.gov.au; Mahon.ChrisM@police.qld.gov.au; Clowes.AnthonyJ@police.qld.gov.au; Brendan.Guy@frasercoast.qld.gov.au; GRANT Andrea; YETMAN Brendon; HARVEY Peter; SEELEITHER Jamie; EMBREY Teena; LAWTON Colin; HEAD Damien; CAMBOURN Neil; KLAASSEN Ben; Corro QPWS gbrmci CIR
Cc: CUBIS Mick; CONNOR Nathan
Subject: Duling update_20201125_1700

Hello all – the latest from the IMT.

Regards, Marc

Marc Dargusch
Principal Ranger – Great Sandy Area
Coastal and Islands Region | QPWS and Partnerships
Department of Environment and Science
M Personal in **P** 07 54869960
Level 6, 12 on First Avenue, Maroochydore 4558
www.des.qld.gov.au

I give my respect to the traditional and custodial Aboriginal and Torres Strait Island Elders and Owners of the Land in which I work, live and walk.

From: CONNOR Nathan <Nathan.Connor@des.qld.gov.au>
Sent: Wednesday, 25 November 2020 4:23 PM
To: Peter.Hollier@qfes.qld.gov.au; DARGUSCH Marc; CUBIS Mick; MCLAUGHLIN Marty; SPINKS Troy
Cc: Brittany Hewson
Subject: Duling update_20201125_1700

Hi Peter and all,

Please note the following updates for Duling Fire;

- Burn out operations to commence (ground operations only) from far northern extent of Smith-Poyungun firebreak in SE direction though to wet area at upper reaches of Poyungun Creek – yellow line on 1st snip.
- Please note that aerial ignition is not required tonight owing to last light issues and visitor management to east. We will look to employ aerial ignition strategy as per attached tomorrow conditions pending – these docs will be updated accordingly.
- Please also see attached Alternative 1 fireline map and Situation Analysis options doc. These will be updated for tomorrow morning.
- We will also provide fall back options for your information tomorrow am.

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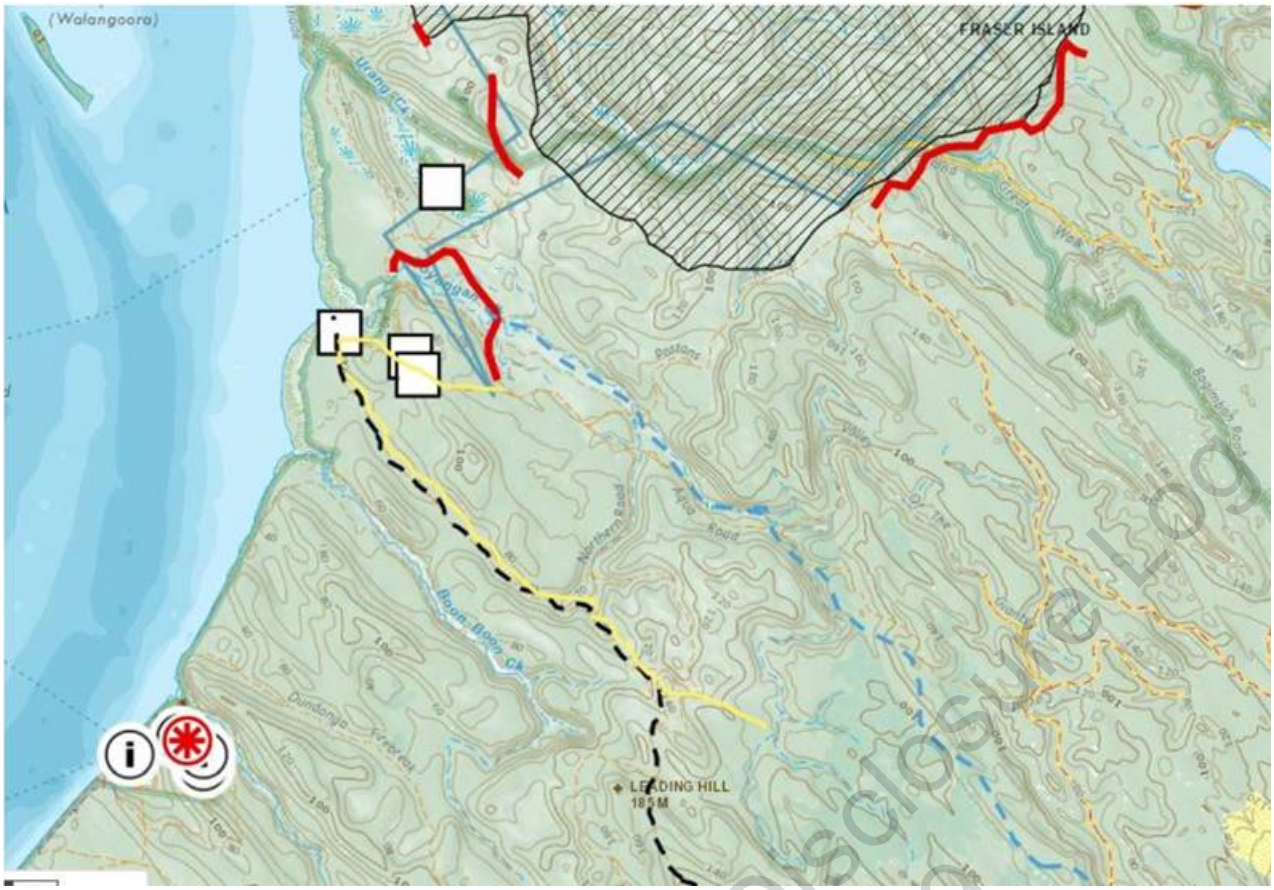

Nathan Connor
Principal Conservation Officer – Fire Management
Technical Services
Queensland Parks and Wildlife Service
Department of Environment and Science

M Personal in

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Date : 20/11/2020 10:26:28 AM
From : "HEAD Damien"
To : "CUBIS Mick"
Subject : Re: Duling WF - way forward

I would have thought such. Need to get going. Before wind changes. All efforts from yidney scrub to west coast on hv road.

Good to know.

Sent from my iPhone

> On 20 Nov 2020, at 9:56 am, CUBIS Mick <Mick.Cubis@des.qld.gov.au> wrote:
>
> Damien, fyi. I spoke to Matt Davies last night who advised me of this being the likely approach. Not too many options. If we don't proceed, the sense is it will gross Moon Point road once the wind becomes a northerly, likely on Monday, but looking bad on Tuesday, gusting at 25 knots, possibly more.
>
> **Mick Cubis**
> Regional Director, Coastal and Islands Region
> **GBRMCI | QPWS & Partnerships**
> Department of Environment and Science
> P: 07 54471137 M: Personal inf
> 240 Moorindil Street, Tewantin
> Qld 4565
> mick.cubis@des.qld.gov.au
>
> ---
>
> **From:** DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au>
> **Sent:** Friday, 20 November 2020 9:15 AM
> **To:** CUBIS Mick
> **Subject:** Duling WF - way forward
>
> Hi Mick – IMT will have a SitRep through around 9am and then an ActionPlan through around 10.30am or so.
>
> Just a heads-up - it is highly likely that the best option will be to commence a slow, controlled and air-supported light-up (until dark then first up the following day) from the western end of Moon Point Road from late this afternoon . Anyways, the IMT will furnish greater details post further scrutiny of forecasts and on-ground conditions.
>
> Regards, Marc
>
> ---
>
> **From:** CUBIS Mick <Mick.Cubis@des.qld.gov.au>
> **Sent:** Thursday, 19 November 2020 3:33 PM
> **To:** KLAASSEN Ben; HEAD Damien; CAMBOURN Neil
> **Cc:** DARGUSCH Marc; DAVIES Matt
> **Subject:** Fwd: Situation Analysis - Duling WF
>
> Latest sitrep and analysis / tactics FYI.
>
> Mick Cubis
> Regional Director
> Coastal and Islands | QPWS&Partnerships
> Department of Environment and Science
> P (07) 54471137 | Mobile Personal inf
>
> Begin forwarded message:
>
> > **From:** DAVIES Matt <Matt.Davies@des.qld.gov.au>
> > **Date:** 19 November 2020 at 3:26:16 pm AEST
> > **To:** DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au>, CUBIS Mick <Mick.Cubis@des.qld.gov.au>, CONNOR Nathan <Nathan.Connor@des.qld.gov.au>
> > **Cc:** CIR Fire Team <CIR.FireTeam@des.qld.gov.au>, BULLEY Graeme <Graeme.Bulley@des.qld.gov.au>, Peter.Roberts2@qfes.qld.gov.au, TAPPLY Jenna <Jenna.Tapply@des.qld.gov.au>, BLACKMAN Boyd <Boyd.Blackman@des.qld.gov.au>, DARGUSCH Anthony <Anthony.Dargusch@des.qld.gov.au>
> > **Subject: Situation Analysis - Duling WF**
> >
> > Hi all,

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Attached is Situation Analysis for Duling wildfire approved by IMT.

Matt

Matt Davies
Senior Project Officer – Technical Support
Coastal and Islands Region I Queensland Parks and Wildlife Service
Department of Environment and Science
P (07) 5459 6102 | **M** Personal info | **E**: matt.davies@des.qld.gov.au
12 First Avenue, Maroochydore Q. 4558

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Date : 13/11/2020 7:23:31 PM
From : "HEAD Damien"
To : "CUBIS Mick"
Cc : "SPINKS Troy"
Subject : Re: Duling WF 1700 SIT REP
Attachment : image002.png;Screenshot 2020-11-13 164212.png;

Appreciate. Good to see focus preparatory efforts

Sent from my iPhone

On 13 Nov 2020, at 5:23 pm, CUBIS Mick <Mick.Cubis@des.qld.gov.au> wrote:

Latest sitrep, fyi.

Sent from my iPhone

Begin forwarded message:

From: DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au>
Date: 13 November 2020 at 5:02:22 pm AEST
To: CUBIS Mick <Mick.Cubis@des.qld.gov.au>
Cc: MACDONALD Stirling <Stirling.MacDonald@des.qld.gov.au>, CIR Fire Team <CIR.FireTeam@des.qld.gov.au>, SEELEITHER Jamie <Jamie.Seeleither@des.qld.gov.au>
Subject: FW: Duling WF 1700 SIT REP

The latest.

M

From: LAVENDER Sven <Sven.Lavender@des.qld.gov.au>
Sent: Friday, 13 November 2020 5:00 PM
To: CIR Fire Team; DARGUSCH Marc; HARVEY Peter; YETMAN Brendon; EDMED Greg
Cc: BEHRENDORFF Linda; GREEN John; KUSKIE James; TAPPLY Jenna; Michael Koch; Chris Hanlon; Fitzpatrick.ShaneB[CR]; VurensVanEs.RolandJ@police.qld.gov.au; SEELEITHER Jamie
Subject: Duling WF 1700 SIT REP

Afternoon All,

- Moderate winds (15 – 20 Knots) from North at this afternoon and the BoM have forecast Very High to Severe FDR for parts of SE Qld over the next 2 – 4 days
- Fire south of Awinya Creek has burnt down South of Bowarrady break toady assuming very close to Woralie break on Western side (remote sensing); observations from Hervey bay indicate fire burning with high intensity at present
- Large volumes of smoke crossing / blowing down eastern Beach south of Dundubara
- Fire now south of Bowarrady break approximately 2.3K heading south with intensity starting to drop as evening approaches (2.3 K along beachfront)
- ***Mobile reception lost at Dundubara please ring landline***- back again this afternoon
- Crews preparing Cathedral beach for direct attack
- Conference today with SR SP and BAC representatives – concerns and assistance from BAC rangers; SR to talk with RIC SMU to sort accommodation and duties
- RFS 12,000 ltr collar tank setup at Cathedral Beach helipad - using as additional water point – helipad to small to use there, needs redeployment for helicopter use, preferably beach front area
- QFES support officer on site this afternoon
- PR to converse with QPS as to trigger point to formalise evacuation of Cathedral beach, QFES liaison to speak to managers again tonight about passive closure of site to public
- Road closed erected along Moon Point Rd and Bullock Rd/ Northern Scenic drive intersections
- Woralie Road eastern beach access to be closed, public at Lake Allom relocated
- Zone 9 Closed as of today, existing campers to be sent warning SMS
- Slashing of Woralie firebreak by contractors has commenced today – pulled back to Eastern side – ridge along knife blade lookout to K'gari, fire crew escorting; Will be deployed to slash / scape Dindeir Sand blow firebreak north of Happy Valley Tomorrow, then back to around K'gari area
- Volunteers to sandy cape yesterday, instructed to prep site for approaching fire

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- QPS to patrolled Coongul CZ today only two boat based camps left, leaving on tide
- Extra QPS assistance is available over weekend on island

IC

DAY

Friday - Saturday– Sven Lavender

Sunday – Tuesday Linda Behrendorff

NIGHT

Friday – Saturday James Kuskie

Logistics Support

Friday - James Kuskie

Saturday – Sunday Jenna Tapply

-

Ground Crews - Friday

Day

1 x NMU

1 X RB

1 X SMU

½ NRM – Machinery operations / Truck driver

1 X Ft Lytton

1 X Straddie

Night

1 X BLSR

1 X NMU

½ NMU IC / Machinery operator

2 X RFS

Incoming crews

Friday PM - Sunday 2 x RFS crews

Saturday PM - Thursday 1 X NSI crew

Monday – Friday 1 X NSI crew + 1 Logistics Officer / IC Support

Sven Lavender
Ranger-in-Charge – K'gari (Fraser Island) North
Coastal and Islands Region / QPWS & Partnerships
Department of Environment and Science

P 07 41 279 138 Ext 9
Dundubara, Fraser Island
PMB 20 MS 2173
Rainbow Beach QLD 4581

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<Screenshot 2020-11-13 164212.png>

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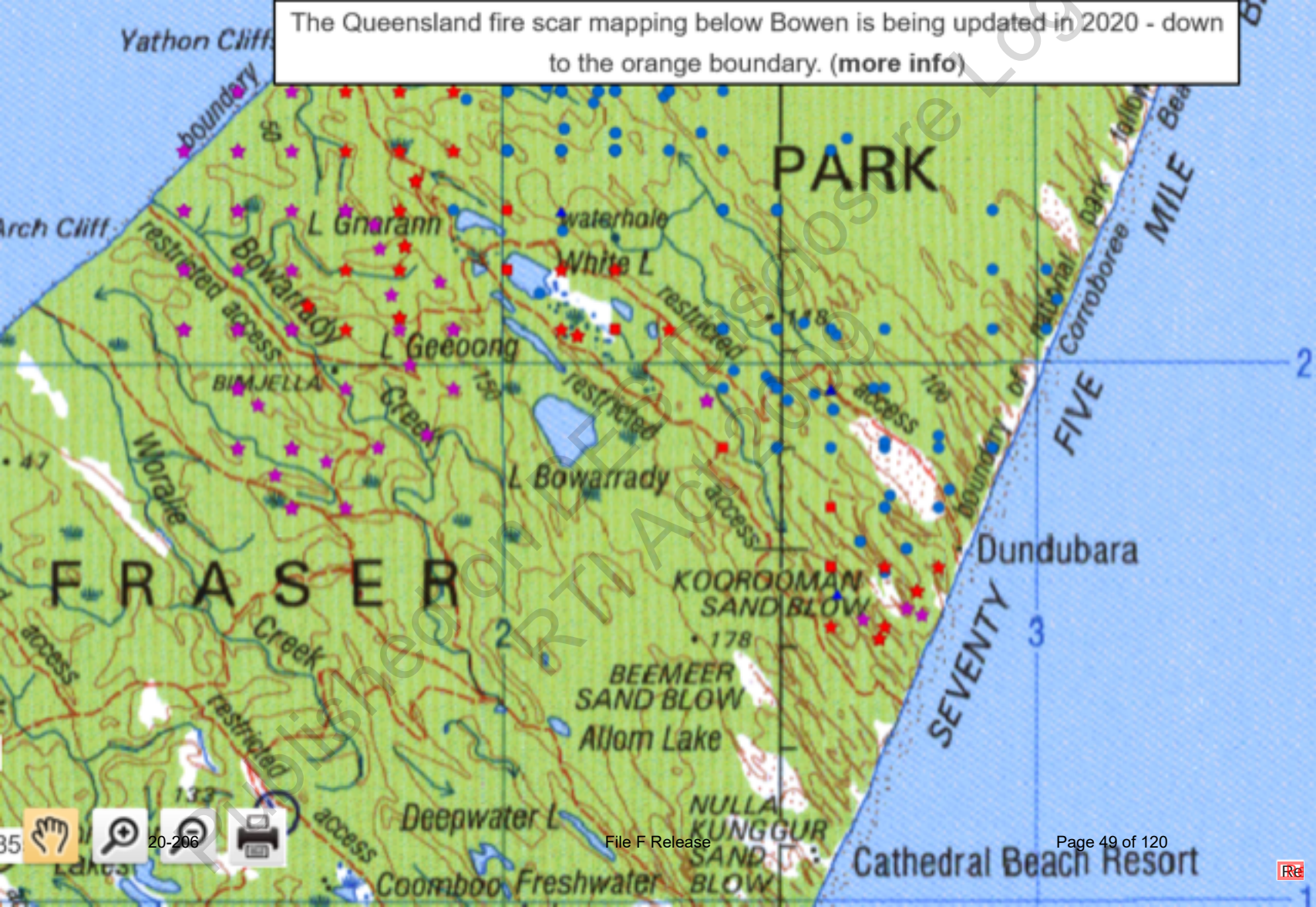

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Date : 16/10/2020 5:20:10 PM
From : "HEAD Damien"
To : "CUBIS Mick"
Subject : Re: Duling WF Back burning operations.
Attachment : image001.png;

Fingers crossed. I share your reservations. Spotting back into wathumba swamp on sundays northerly. It is a long line to hold.

Sent from my iPhone

On 16 Oct 2020, at 4:16 pm, CUBIS Mick <Mick.Cubis@des.qld.gov.au> wrote:

Damien, back burn planned for tomorrow, as detailed below.

Thanks

Mick Cubis
Regional Director
Coastal and Islands | QPWS&Partnerships
Department of Environment and Science
P (07) 54471137 | Mobile Personal info

Begin forwarded message:

From: DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au>
Date: 16 October 2020 at 4:12:58 pm AEST
To: CUBIS Mick <Mick.Cubis@des.qld.gov.au>
Cc: HARVEY Peter <Peter.Harvey@des.qld.gov.au>, YETMAN Brendon <Brendon.Yetman@des.qld.gov.au>, SEELEITHER Jamie <Jamie.Seeleither@des.qld.gov.au>, KLEKAR John <John.Klekar@des.qld.gov.au>, EMBREY Teena <Teena.Embrey@des.qld.gov.au>
Subject: RE: Duling WF Back burning operations.

No probs. Comfortable as we can be with limited options.

Resource levels pretty good for Saturday work.

Regards, M

<image001.png>

From: CUBIS Mick <Mick.Cubis@des.qld.gov.au>
Sent: Friday, 16 October 2020 4:08 PM
To: DARGUSCH Marc
Cc: HARVEY Peter; YETMAN Brendon; SEELEITHER Jamie; KLEKAR John; EMBREY Teena
Subject: Re: Duling WF Back burning operations.

Thanks Marc

Are we comfortable that there is low risk of a spotover with the forecast for Sunday and that we can hold the line?

Mick Cubis
Regional Director
Coastal and Islands | QPWS&Partnerships
Department of Environment and Science
P (07) 54471137 | Mobile Personal info

On 16 Oct 2020, at 3:59 pm, DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au> wrote:

Mick – Plans are in place for the K'gari crew to undertake a planned back-burn to manage the current wildfire on the northern end of K'gari (see attached and below email trail). Communication has occurred with QFES (as per below email trail) with note that resourcing is also being provided by local Rural Fire Brigades.

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A fall-back option has been identified with a further fire crew from Cooloola being available at short notice.

Regards, Marc

<image002.png>

Marc Dargusch
Principal Ranger – Great Sandy Area
Coastal and Islands Region | QPWS and Partnerships
Department of Environment and Science
M Personal inf **P** 07 54869960
Level 6, 12 on First Avenue, Maroochydore 4558
www.des.qld.gov.au
I give my respect to the traditional and custodial Aboriginal and Torres Strait Island Elders and Owners of the Land in which I work, live and walk.

From: Andrew Marnie <Andrew.Marnie@qfes.qld.gov.au>
Sent: Friday, 16 October 2020 1:26 PM
To: KUSKIE James
Cc: HARVEY Peter; DARGUSCH Marc; DARGUSCH Anthony; EDMED Greg; GREEN John; LAVENDER Sven
Subject: RE: Duling WF Back burning operations.

Thanks James

Appreciate the update

Regards

Andrew

Andrew Marnie
Acting Inspector
Area Director Maryborough

Personal infor

<image003.jpg>

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All reasonable precautions will be taken to respect the privacy of individuals in accordance with the Information Privacy Act 2009 (Qld).

From: KUSKIE James <James.Kuskie@des.qld.gov.au>
Sent: Friday, 16 October 2020 10:04 AM
To: Andrew Marnie <Andrew.Marnie@qfes.qld.gov.au>
Cc: HARVEY Peter <Peter.Harvey@des.qld.gov.au>; DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au>; DARGUSCH Anthony <Anthony.Dargusch@des.qld.gov.au>; EDMED Greg <Greg.edmed@des.qld.gov.au>; GREEN John <John.Green@des.qld.gov.au>; LAVENDER Sven <Sven.Lavender@des.qld.gov.au>
Subject: Duling WF Back burning operations.

Attached is the map of our planned back burn for the 17/10/20

Local conditions on ground DI 8 and KBDI of 83

At present 4 QPWS light attack vehicles
1 rural crew 51
1 tractor with slasher on site

Plan is 1 light up crew and 1 support crew to start from B and light towards A marked on map depending upon recent prescribed burn edge as the block containing the sand blow on the eastern side was burnt this burn season gone.

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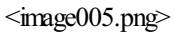
1 light up crew and 2 support crew to start from B and light towards C marked on map

Commence back burn from 9am and continue through until safe edge achieved.
Fall back plan is to withdraw to the Wathumba road fire line on Sunday.



James Kuskie
004 Ranger K'gari (Fraser Island) North
Coastal and Islands Region / QPWS & Partnerships
Department of Environment and Science

P 07 41 279 138 Ext 9
Dundubara, Fraser Island
PMB 20 MS 2173
Rainbow Beach QLD 4581

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<Duling WF.png>

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24.96°S, 153.31°E

Save as my local

NOW IN ORCHID BEACH

PAST 24 HOURS

Updated at 16:00 EST

25.4°C

Feels like 21.8 °C

Dew Point
12.3 °C

Gusts
28km/h

Relative Humidity
44%

Pressure
1015.6hPa

Wind
E 22km/h

Rainfall
0.0mm

HERVEY BAY MARYBOROUGH BUNDABERG

LADY ELLIOT ISLAND

ORCHID BEACH FRIDAY FORECAST

Mostly sunny

15 °C 27 °C

5%
< 1mm

Orchid Beach for Friday

Mostly sunny. Patchy fog inland early this morning. Slight chance of a shower about Fraser Island in the morning, near zero chance elsewhere. Light winds. Daytime maximum temperatures around 30.

Fire Danger
High

DAM LEVELS

28 DAYS RAINFALL | 12 MONTHS RAINFALL | NEXT 48 HOURS

ORCHID BEACH 7 DAY FORECAST

	FRI Oct 16		SAT Oct 17		SUN Oct 18		MON Oct 19		TUE Oct 20		WED Oct 21		THU Oct 22	
Summary	Mostly sunny		Mostly sunny		Mostly sunny		Mostly sunny		Clearing shower		Possible shower		Late shower	
Maximum	27°C		27°C		27°C		28°C		27°C		27°C		28°C	
Minimum	15°C		15°C		16°C		17°C		17°C		17°C		17°C	
Chance Of Rain	5%		5%		20%		40%		40%		60%		40%	
Rain Amount	< 1mm		< 1mm		< 1mm		1-5mm		< 1mm		1-5mm		< 1mm	
UV Index	Very High		Very High		Very High		Very High		-		-		-	
Frost Risk	Nil		Nil		Nil		Nil		Nil		Nil		Nil	
	9am	3pm	9am	3pm	9am	3pm	9am	3pm	9am	3pm	9am	3pm	9am	3pm
Wind Speed	20 km/h	20 km/h	18 km/h	16 km/h	18 km/h	18 km/h	21 km/h	21 km/h	13 km/h	19 km/h	16 km/h	17 km/h	13 km/h	16 km/h
Wind Direction	SE	ESE	E	E	NE	NNE	NNW	N	ESE	ESE	ESE	ESE	E	E
Relative Humidity	66%	65%	61%	62%	65%	67%	70%	72%	74%	73%	72%	75%	70%	71%

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Date : 24/11/2020 2:16:51 PM
From : "HEAD Damien"
To : "CAMBOURN Neil"
Subject : RE: Duling Wildfire K'Gari 24/11/2020 as at 1230
Attachment : image002.png;image005.png;image008.png;image009.png;image011.jpg;image012.jpg;image013.png;

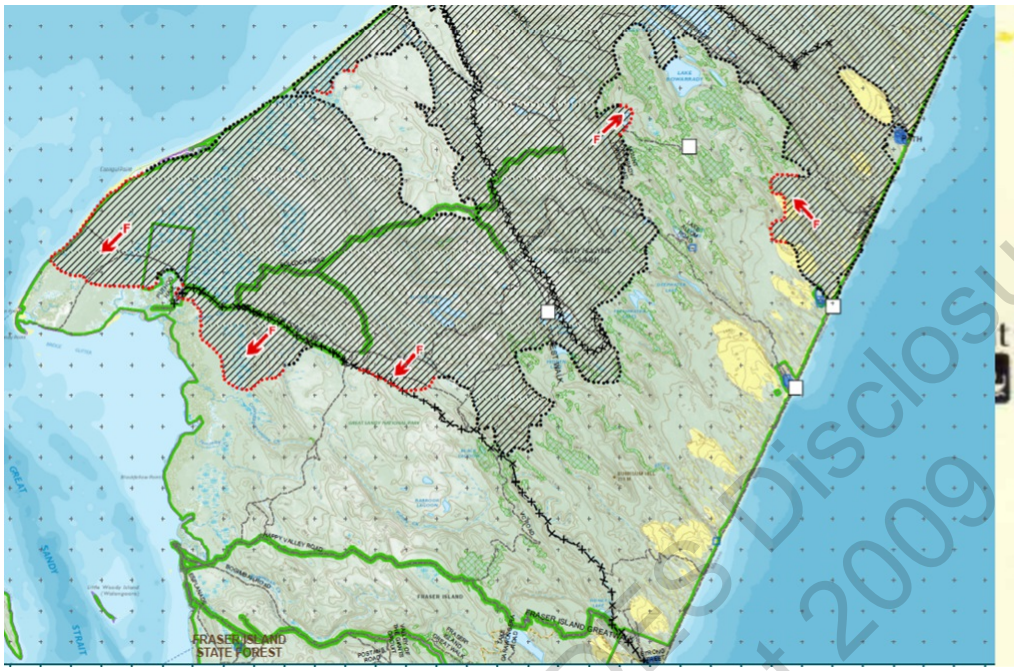
This is why the threat (at this point in time) to life and property on the east coast (Happy Valley) is being overstated. Terms like ember attack being used today are just inappropriate.
In my discussion with Marc, who had Matt beside him, they indicated it had not moved through the closed forest as yet.

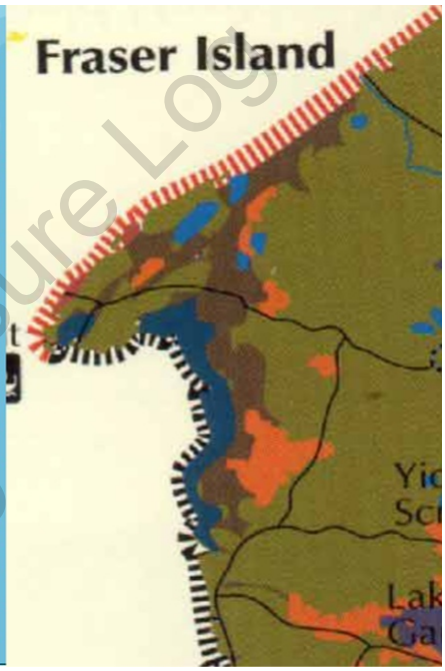
If it hasn't breached it now it is not going to threaten HV before the wind change and milder temperatures tonight. On a southerly and even a sprinkling over showers it should go out on along its eastern edge.

Fingers crossed that some storms hit the island this evening, even though I fear they will be further south again.

From: CAMBOURN Neil <Neil.Cambourn@des.qld.gov.au>
Sent: Tuesday, 24 November 2020 2:02 PM
To: HEAD Damien; DARGUSCH Marc; CUBIS Mick
Subject: RE: Duling Wildfire K'Gari 24/11/2020 as at 1230

I think the modelling is incorrect.
If we overlay the veg map to the fire map, it's clear to see it has pulled up at the rainforest line, so will not get to Happy Valley on current trajectory in my view.
The line follows exactly that wetter veg line map to map.





Neil Cambourn
Assistant Director-General
Queensland Parks and Wildlife Service and Partnerships
Department of Environment and Science
P 07 3199 7518 M [redacted]
Level 5, 400 George Street, Brisbane QLD 4000

From: HEAD Damien <Damien.Head@des.qld.gov.au>
Sent: Tuesday, 24 November 2020 1:38 PM
To: DARGUSCH Marc; CUBIS Mick; CAMBOURN Neil
Subject: RE: Duling Wildfire K'Gari 24/11/2020 as at 1230

Marc

Question. Looking at the assumption of the modelling. Is there consideration to the vegetation type in there? That is some pretty aggressive modelling along an edge that hasn't progressed much over the past 7 days. All the fires movement has largely been to the south

---

From: DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au>
Sent: Tuesday, 24 November 2020 1:32 PM
To: HEAD Damien; CUBIS Mick; CAMBOURN Neil
Subject: FW: Duling Wildfire K'Gari 24/11/2020 as at 1230

Hi Mick/Damien/Neil - Situation @ 1300hrs 20201124:

- The main fire continues to move in a south easterly direction with poor fire weather conditions on the island.
- The community of Happy Valley is potentially under threat within the next 24hrs ***although*** the latest mapping and predictions indicate this threat has abated with an improved forecast. QFES, RFS, QPWS and QPS, Ambulance are working together to prepare the community. It is worth noting that the fire has not yet exited the closed forest into the dryer eastern vegetation types.
- Forecast wind change easterly at about 4.00am 25/11/2020 will further lessen the current risk to Happy Valley.
- Fire to the south has now just over the Bogimbah Track.

- Other sectors:
  - Active fire at the north of the island at Sandy Cape sector is being monitored.
  - Cathedral Beach sector is blacking out.

- IMT has relocated and ramped up (refer attached pdf) to Rainbow Beach. Nathan Connor is now the IC.
- Divisional control is operating out of QPWS Dundabara.

Given the fire proximity to Happy Valley (and smaller communities to south including Yidney Rocks etc) + Kingfisher Bay Resort the current QPWS run IMT would be comfortable with QFES taking control if QFES happy to attempt to utilise the Smith-Poyungun Road as the southern control line & have QPWS on IMT with them.

Some fire predictions are contained below.

Regards, Marc

Marc Dargusch
Principal Ranger – Great Sandy Area
Coastal and Islands Region | QPWS and Partnerships
Department of Environment and Science
M [redacted] P 07 54869960
Level 6, 12 on First Avenue, Maroochydore 4558
www.des.qld.gov.au
I give my respect to the traditional and custodial Aboriginal and Torres Strait Island Elders and Owners of the Land in which I work, live and walk.

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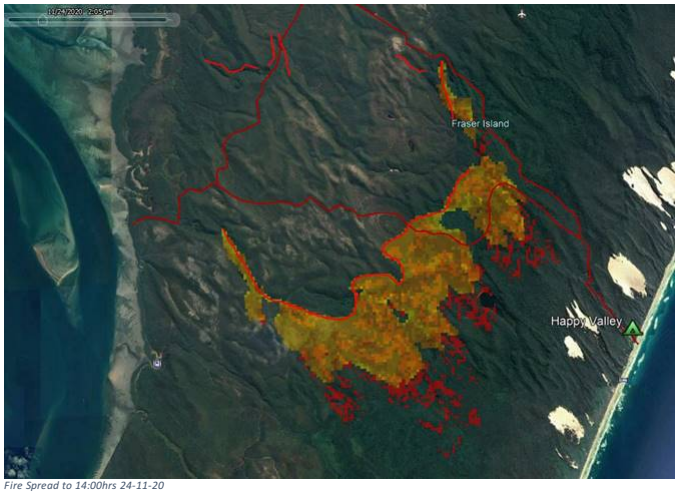
Predicted fire spread details below as sourced from QFES FBAN imbedded in IMT Rainbow;

Fire spread prediction generated this morning for Fraser Island - Happy Valley.
The image below is for 14:00 hrs today & 0100 hrs Wednesday. The Simulation runs through to 25th November in the attached KMZ file, but this will be revised throughout today as new mapping is made available.



Fire Spread to 14:00hrs 24-11-20

Fire Spread to 0100hrs 25th Nov 2020

Assumptions used to develop this prediction:

- Active fire edge as determined by Air Obs at 08:20hrs 24-11-20 have been used.
- No active fire suppression is being undertaken.
- No additional backburning has been undertaken.
- Phoenix standard inputs have not been adjusted.
- Weather is from BOM grids downloaded this morning.

John Atkinson
Senior Project Officer
Fire Team | Queensland Parks and Wildlife Service
Department of Environment and Science
P 07 4999 8533 | **E** John.Atkinson@des.qld.gov.au
Level 5 | 44 Nelsen Street | Mackay

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Date : 15/10/2020 3:54:05 PM
From : "HEAD Damien"
To : "CUBIS Mick" , "CAMBOURN Neil"
Cc : "DARGUSCH Marc"
Subject : RE: Duling wildfire update 1500
Attachment : image001.png;image002.png;image005.png;

Fingers crossed we can hold off as long as we can and not create another long fire front to manage and hold

---

From: CUBIS Mick <Mick.Cubis@des.qld.gov.au>
Sent: Thursday, 15 October 2020 3:42 PM
To: HEAD Damien; CAMBOURN Neil
Cc: DARGUSCH Marc
Subject: FW: Duling wildfire update 1500

Latest sitrep fyi.

Mick Cubis
Regional Director, Coastal and Islands Region
GBRMCI | QPWS & Partnerships
Department of Environment and Science
P: 07 54471137 M: Personal info
240 Moorindil Street, Tewantin
Qld 4565
mick.cubis@des.qld.gov.au

From: DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au>
Sent: Thursday, 15 October 2020 3:34 PM
To: CUBIS Mick
Subject: FW: Duling wildfire update 1500

Hi Mick – some more info on the current situation. I'll be taking part in a Teams Meet at 7.30am tomorrow with key players to drill down into fire tactics for the coming days including reviewing modelling data from QFES.

As a heads up I'm thinking that we will need to shut the Platypus Bay Road tomorrow as a precautionary measure. Unless we get significant rain it is likely we will burn off this road at some stage.

Regards, Marc

Queensland Government

Marc Dargusch
Principal Ranger – Great Sandy Area
Coastal and Islands Region | QPWS and Partnerships
Department of Environment and Science
M Personal info P 07 54869960
Level 6, 12 on First Avenue, Maroochydore 4558
www.des.qld.gov.au

I give my respect to the traditional and custodial Aboriginal and Torres Strait Island Elders and Owners of the Land in which I work, live and walk.

From: KUSKIE James <James.Kuskie@des.qld.gov.au>
Sent: Thursday, 15 October 2020 3:13 PM
To: DARGUSCH Anthony; DARGUSCH Marc; HARVEY Peter; LAVENDER Sven
Subject: Duling wildfire update 1500

Attached is the latest imagery for the wild fire.

All campers in Duling and Ocean lake have been removed and signage installed.

The fire is currently still traveling in a NE direction.

Temp at 1500 23 deg, wind 8kph from SE Hum 65%

1 QPWS crew still on site to give final update at 430pm.

Queensland Government

James Kuskie
004 Ranger K'gari (Fraser Island) North
Coastal and Islands Region / QPWS & Partnerships
Department of Environment and Science
P 07 41 279 138 Ext 9

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Dundubara, Fraser Island
PMB 20 MS 2173
Rainbow Beach QLD 4581

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Untitled Map

Write a description for your map.

Fraser Island

Fraser Island

Google Earth

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Image © 2021 Maxar Technologies
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2021 CNES / Airbus

Legend

- Feature 1
- Feature 2
- FLAME_HT
- FLAME_HT
- FLAME_HT
- FLAME_HT
- FLAME_HT
- FLAME_HT
- FLAME_HT
- Fraser Island
- Fraser Island Airport
- Fraser Island Waiuta Retreat
- Frasers @ Cathedral Beach
- S.S. Maheno
- WENT_OUT

N

6 km

Date : 11/11/2020 4:39:27 PM
From : "HEAD Damien"
To : "CUBIS Mick" , "CAMBOURN Neil"
Subject : RE: K'gari Wildfire mitigation strategies
Attachment : image002.png;image005.jpg;image003.png;

Mick

I see no reference to what the objectives are. It appears our goal appears to be putting the fire out? Or are we aiming for containment? If so the containment is for what purpose? – undesirable burn frequency in previously burnt country. Is the burn occurring at an undesirable intensity? Is it so we minimise disruption to campers and tourism?

We appear to be jumping to strategies before determining what our objectives should be.

I am just seeing strategies to stop the fire and those strategies are likely more threatening to the environment than the fire that is occurring and doing largely what the landscape needs as long as the intensity is not too severe.

My thoughts are that our objectives should be:
Objective 1: Asset protection of Catherdals and Kgari camp.

Strategies/Actions:

1. Strengthen our APZs at locations in the fires path i.e. fire breaks, assessing fuel loads in the APZs so they are functional and prepared.
2. Clean out and up kgari camp. (potentially something they would appreciate regardless)
3. for when optimal weather windows present conduct backburning either a) in the APZs or b) off the APZs. The APZ are likely to carry lighter fuel loads to either successfully achieve a hazard reduction burn. Or if the fuel loads are low in the APZs then the likelihood of spot over when burning off the APZ is low.
4. Contemplate conducting a backburn around the AZ when fire is within XX km in sub-optimal weather if necessary.

Objective 2: Containment north of xx break to mitigate against uniform burn interval across Kgari's network of west coast swamp REs. ?????
(Merely suggesting in the absence of the fire history and knowledge of current burnt areas and the mosaic achieved)

Strategies/Actions

1. Prep firelines in readiness for backburning when optimal supporting weather conditions present.

The statement of threatening townships at this stage may be a little misplaced in my opinion and as you have suggested.

Even the reference to trying to put out the fire one the west coast is being contemplated but I am again not sure for what objective exactly. Just because?

There may be value in convening a meeting with our fire team and marc again to talk some of this through for a agreed DES position.

Damien

From: CUBIS Mick <Mick.Cubis@des.qld.gov.au>
Sent: Wednesday, 11 November 2020 3:32 PM
To: HEAD Damien; CAMBOURN Neil
Subject: FW: K'gari Wildfire mitigation strategies
Importance: High

Damien and Neil, I don't think the strategies proposed below are viable, both from an impact perspective (ie impact of retardants) or the cost ($200 – 300 k.)

Perhaps this could be employed for direct attack if and when life and property are threatened, but the front is still at least 5 km from Cathedrals.

Keen on your thoughts,

thanks

Mick Cubis
Regional Director, Coastal and Islands Region
GBRMCI | QPWS & Partnerships
Department of Environment and Science
P: 07 54471137 M: Personal Info
240 Moorindil Street, Tewantin
Qld 4565
mick.cubis@des.qld.gov.au

From: DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au>
Sent: Wednesday, 11 November 2020 2:56 PM
To: CUBIS Mick
Cc: CIR Fire Team; MACDONALD Stirling; SEELEITHER Jamie; YETMAN Brendon; HARVEY Peter

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Subject: K'gari Wildfire mitigation strategies

Hi Mick – I've just come from a meeting with QFES and QPS at the Maryborough Police Station.

There is growing concern from all agencies that the only way that this fire will be controlled/extinguished will be via rain if we don't employ other methods. The fire has already threatened one community (Orchid Beach) and is very close to threatening Cathedral's on Fraser and K'gari Camp (which is has very poor protection via its current firebreaks). If this fire continues to run Happy Valley community will also be under threat.

QFES have put forward a proposal below that they believe will at best put out the fire or at worst, buy time to employ other methods. QFES have advised that using water enhancers (retardant or like) greatly increases the effectiveness but I flagged that this would be a concern due to the World Heritage status of K'gari.

Some other points to note:

- If we are to employ Option 1 we would need to action it first up tomorrow morning to maximise opportunity with fire weather conditions + time it before fire intensity increases post 9mm of rain yesterday evening.
- There are considerable costs involved (see below).
- Both QPS and QFES are strongly supportive of employing this type of strategy.
- Northerly influenced winds are forecast for over a week from tomorrow afternoon.
- No substantial rain is forecast until earlier in December 2020.

Are you able to test appetite for employing this type of strategy/level of expenditure ? Whilst QFES are looking at QPWS to fund I think there would be room for negotiation of who pays what at a higher level as we are really talking about protection of life and property.

For your consideration, Marc

Marc Dargusch
Principal Ranger – Great Sandy Area
Coastal and Islands Region | QPWS and Partnerships
Department of Environment and Science
M Personal in **P** 07 54869960
Level 6, 12 on First Avenue, Maroochydore 4558
www.des.qld.gov.au
I give my respect to the traditional and custodial Aboriginal and Torres Strait Island Elders and Owners of the Land in which I work, live and walk.

From: Michael Koch <Michael.Koch@qfes.qld.gov.au>
Sent: Wednesday, 11 November 2020 2:05 PM
To: DARGUSCH Marc
Subject: Fwd: Fraser Strategies

Get Outlook for iOS

From: Ross Stacey <Ross.Stacey@qfes.qld.gov.au>
Sent: Wednesday, November 11, 2020 13:47
To: Michael Koch
Cc: Shannon Smith
Subject: Fraser Strategies

Hi Michael,

I have looked into the Fraser Island situation and come up with a couple of plans for you to discuss with QPWS.

From looking at the current mapping I see two objectives. The western side of the fire appears to have jumped the break and be moving into open swamp / low area. Without knowing the veg condition at the moment, is this likely to move quickly through the area, and hence might need attention in a priority?

Aside from the western piece we could use a direct attack strategy using fresh water to slow fire progression on the approach to the marked break running all the way to the east. The consideration with this would be that there is limited impact on the fire when not using water enhancers such as foam or gel and ground crews need to be on site to hold breaks. The aircraft would be successful in taking the sting out of the fire.

1. Proposal 1
    1. 4 x 802

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    1. Various combinations of either wheeled or float 802's
2. Cost estimate on 16km of fire break using just water
    1. Roughly $200,000 - $220,000 for 13 hours work amongst four wheeled machines coming out of Hervey Bay dumping about 320,000 litres. 3000 litres of water on the line every 15 mins
    2. We could go a little higher on this cost if we introduce a float plane but would have water on the line every 5 mins (salt water)
    3. Would be 13 hours of work, potentially shortened with the introduction of a float machine
    4. We would need 3 hours' notice to get aircraft on site into work
2. Proposal 2
    1. 1 x LAT and 3 x 802
    2. Cost estimate would be $300,000 +
    3. Ideally we would use water enhancers out of the LAT for strategic drops
    4. Could start strategy within 1 hour (LAT on standby at Bundaberg)

I understand their maybe the desire to not use water enhancers given the environment of the location. With this in mind this would preclude the LAT from being a viable option.

Happy to discuss more if required,

Regards

Ross Stacey
A/Manager State Air Operations
State Air Operations Unit
Queensland Fire and Emergency Services
M Personal info
State Air Desk (07) 3635 1400

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Date : 19/10/2020 4:32:32 PM
From : "HEAD Damien"
To : "DARGUSCH Marc"
Cc : "CUBIS Mick"
Subject : RE: On phone to District Disaster Officer .... want me to call soon ?

Just spoke to mick. We should have a chat. Also refer to my emails and QFERS own fire summary report.

I cant support a backburn operation in 20 knts from the SE tomorrow pushing the backburn directly into the township particularly when you reach the switch back to the south of Orchid on your map. Doing a back burn is also counter to their own advise too.

From: DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au>
Sent: Monday, 19 October 2020 4:22 PM
To: HEAD Damien
Subject: On phone to District Disaster Officer .... want me to call soon ?

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Date : 13/11/2020 7:20:50 PM
From : "HEAD Damien"
To : "CUBIS Mick"
Subject : Re: Potential Smoke impact and probabilistic impact of fire for Fraser Island
Attachment : image001.jpg;image002.jpg;image004.jpg;image009.jpg;

Spoke to James about the smoke impact. Should ease over rainbow and coolooloola in about 24 hours he said. Be pushed to sea late tomorrow.

However we should expect some media enquires. We will have to do media over weekend I suspect

In precaution the moving of campers and the the smoke over the townships is anticipated to ease over the coming days a wind shifts.

The fire modelling and its location is not offensive. I actually thought it was further east than that. It is really coming off the west coast.

Sent from my iPhone

> On 13 Nov 2020, at 5:24 pm, CUBIS Mick <Mick.Cubis@des.qld.gov.au> wrote:
>
> FYI
>
> Sent from my iPhone
>
> Begin forwarded message:
>
> **From:** DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au>
> **Date:** 13 November 2020 at 5:20:39 pm AEST
> **To:** CUBIS Mick <Mick.Cubis@des.qld.gov.au>
> **Cc:** MACDONALD Stirling <Stirling.MacDonald@des.qld.gov.au>, CIR Fire Team <CIR.FireTeam@des.qld.gov.au>, SEELEITHER Jamie <Jamie.Seeleither@des.qld.gov.au>
> **Subject: FW: Potential Smoke impact and probabilistic impact of fire for Fraser Island**
>
> Some ugly pictures you may want to pass on ;)
>
> ---
>
> **From:** Michael Koch <Michael.Koch@qfes.qld.gov.au>
> **Sent:** Friday, 13 November 2020 5:08 PM
> **To:** DARGUSCH Marc
> **Subject:** FW: Potential Smoke impact and probabilistic impact of fire for Fraser Island
>
> **Michael Koch**
> Area Director
> Rural Fire Service
> Maryborough Area Office
> **Queensland Fire and Emergency Services**
> **M** Personal ir **P (07) 4122 0337**
> _____
> <image001.jpg>
>
> ---
>
> **From:** SOC Plan Model Predict Unit <SOC.PlanModelPredictUnit@qfes.qld.gov.au>
> **Sent:** Friday, 13 November 2020 4:13 PM
> **To:** PSU Reports NCR <PSUReportsNCR@qfes.qld.gov.au>
> **Subject:** Potential Smoke impact and probabilistic impact of fire for Fraser Island
>
> State Coordinator
>
> I have the ability to generate a smoke dispersion model using Global Forecast System (GFS) weather and I had a conversation with David Grant who said that this weather would be suitable for a smoke model run for Fraser Island. David gave me the heads up that Noosa may experience some issues with smoke along with Tin Can Bay and Rainbow Beach over the next 12 hours or so. Below is a screenshot of the potential smoke and it will move out to see with the wind change tomorrow morning.
>
> http://kedshrges01.desqld.internal/Html5Viewer/Index.html?configBase=http://kedshrges01.desqld.internal/Geocortex/Essentials/REST/sites/Fire_Predictions_Test/viewers/H1/virtualdirectory/Resources/Config/Default
>
> <image002.jpg>
>
> The images below are from the SABRE probabilistic model. The darker the colours shows the more likely the impact. The second image includes the spotting potential.
>
> <image004.jpg>
>
> <image009.jpg>

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Regards

Insert your Name above

Fire Behaviour Analyst
State Operations Centre
Queensland Fire and Emergency Services I State Operational Coordination Branch
Level 2 Disaster Management Centre I 125 Kedron Park Rd I Kedron Q4031

To contact the On-Call FBAN please call 3635 1808.

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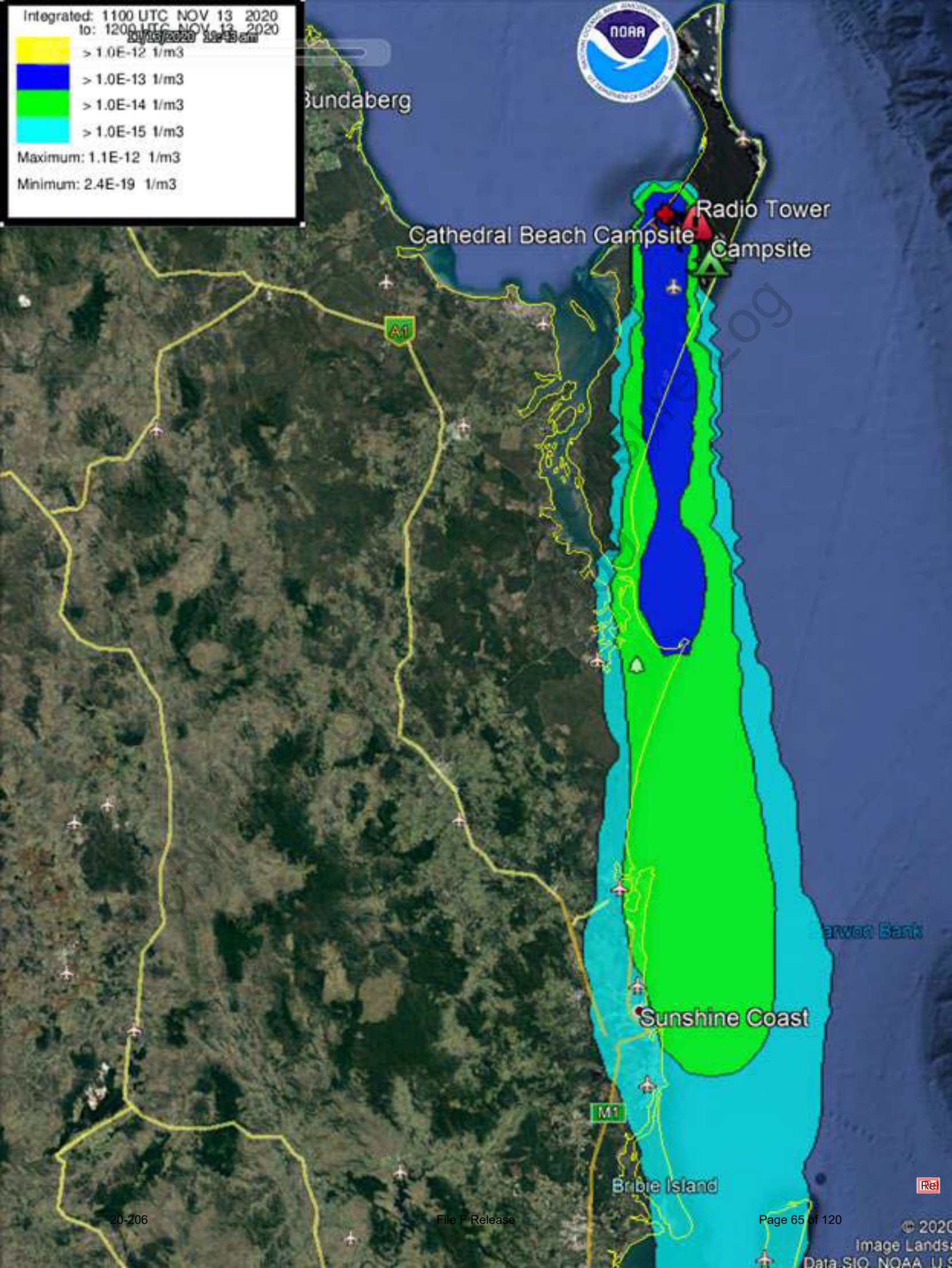
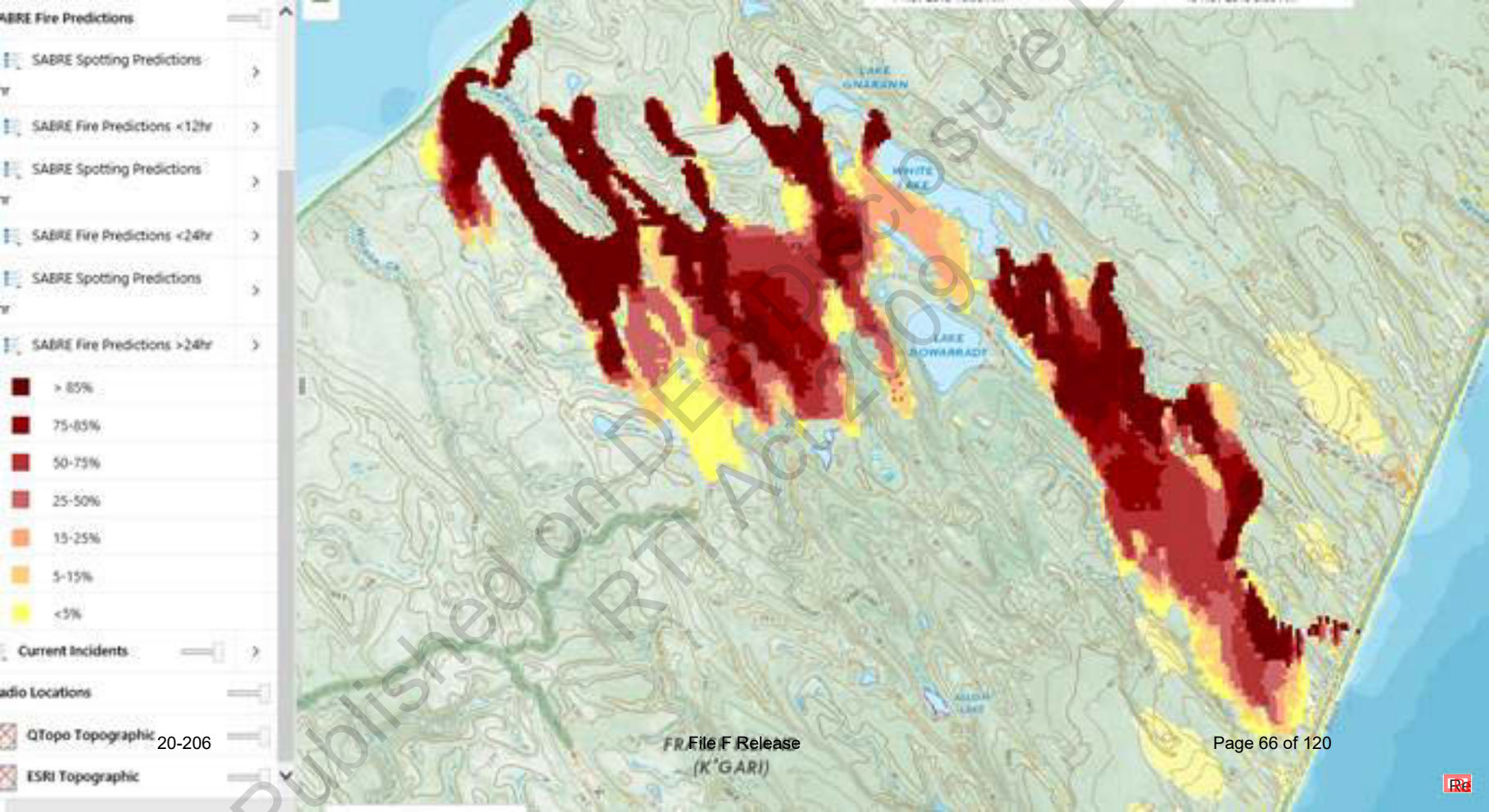

Integrated: 1100 UTC NOV 13 2020
to: 1200 UTC NOV 13 2020
> 1.0E-12 1/m3
> 1.0E-13 1/m3
> 1.0E-14 1/m3
> 1.0E-15 1/m3
Maximum: 1.1E-12 1/m3
Minimum: 2.4E-19 1/m3
Bundaberg
Radio Tower
Cathedral Beach Campsite
Campsite
A1
Sunshine Coast
M1
Bribie Island



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Date : 15/11/2020 11:17:25 AM
From : Damien.Head@des.qld.gov.au
To : "DARGUSCH Marc"
Cc : "CUBIS Mick" , "CAMBOURN Neil"
Subject : Re: QEMR as at 15/11/2020 10:00

Thumbs up. Cheers.

Sent from my iPhone

> On 15 Nov 2020, at 11:16 am, DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au> wrote:
>
> Damien – can confirm that Waterbombing with rotary aircraft/bambi bucket occurred morning of Thursday 12Nov2020 - approved 9.04am Thursday 12Nov2020. Refer attached.
>
> It was worth a go ….. but regrettably didn't work.
>
> M
>
>
>
>
> From: HEAD Damien <Damien.Head@des.qld.gov.au>
> Sent: Sunday, 15 November 2020 11:05 AM
> To: DARGUSCH Marc
> Cc: CUBIS Mick; CAMBOURN Neil
> Subject: Re: QEMR as at 15/11/2020 10:00
>
> Marc.
>
> Was that waterbombing a few days ago or yesterday. Media harassing me still.
> Sent from my iPhone
>
>
> On 15 Nov 2020, at 10:47 am, DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au<mailto:Marc.Dargusch@des.qld.gov.au>> wrote:
>
> Interim interaction with QFES is that only Observation mapping has occurred (besides QPWS initiated waterbombing effort as attempt to lock up progress of western front on far western edge of Awinya Fbreak) ….. 'Planning has taken place for waterbombing effort but no request has been made or tasking occurred'.
>
> Regards, M
>
>
> From: DARGUSCH Marc
> Sent: Sunday, 15 November 2020 10:15 AM
> To: HEAD Damien; CUBIS Mick
> Cc: CAMBOURN Neil
> Subject: RE: QEMR as at 15/11/2020 10:00
>
> Sure – kneejerk is that the waterbombing referred to effort on western edge of Awinya Fbreak in attempt to lock up western fire front. Nothing that I know of in east but …….. I will check.
>
> M
>
> From: HEAD Damien <Damien.Head@des.qld.gov.au<mailto:Damien.Head@des.qld.gov.au>>
> Sent: Sunday, 15 November 2020 10:13 AM
> To: DARGUSCH Marc; CUBIS Mick; CAMBOURN Neil
> Subject: Fwd: QEMR as at 15/11/2020 10:00
>
> Marc
>
> You will need to confirm status.
> Sent from my iPhone
>
> Begin forwarded message:
> From: Media DES <Media@des.qld.gov.au<mailto:Media@des.qld.gov.au>>
> Date: 15 November 2020 at 10:10:46 am AEST
> To: HEAD Damien <Damien.Head@des.qld.gov.au<mailto:Damien.Head@des.qld.gov.au>>
> Cc: DAVIDSON Brent <Brent.Davidson@des.qld.gov.au<mailto:Brent.Davidson@des.qld.gov.au>>, GRANT Andrea <Andrea.Grant@des.qld.gov.au<mailto:Andrea.Grant@des.qld.gov.au>>
> Subject: FW: QEMR as at 15/11/2020 10:00
>
> Hi Damien,
>
> Just further to our chat about water bombing which we say hasn't happened – this QFES report (see below) says they did water bombing.
>
> QFES Significant Operations
>
> o Fraser Coast LGA: Queensland Fire & Emergency Service crews continue to assist Queensland Parks and Wildlife Service with a bush fire on Fraser Island. QPS declared an Emergency Situation under the PSPA yesterday as the fire encroached on campsites and buildings at the Cathedrals, on the eastern side of the island. Water bombing aircraft conducted water drops yesterday with further aerial support expected today. •

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>
> <image004.png>
> Felicity Moore
> Senior Media Officer
> Media Unit | Corporate Communications
> Department of Environment and Science
> ----------
> P 07 3339 5831
> M Personal inf
> GPO Box 2454, Brisbane QLD 4001
> Visit the Environment Media Centre<https://www.des.qld.gov.au/our-department/news-media/media-centre>
>
> <image005.png>
> Visit us on Twitter <http://www.twitter.com/qldenvironment>
>
> <image006.png>
> Chat with me on Teams!<https://teams.microsoft.com/l/chat/0/0?users=felicity.moore@des.qld.gov.au>
> If it's a media matter, please include the group email media@des.qld.gov.au<mailto:media@des.qld.gov.au>
> Website www.des.qld.gov.au<http://www.des.qld.gov.au/>
>
> From: NGComms <sdccqfes@id.ngcomms.net<mailto:sdccqfes@id.ngcomms.net>> On Behalf Of State Disaster Coordination Centre
> Sent: Sunday, 15 November 2020 10:00 AM
> To: DES Disaster & Disruption Network
> Subject: QEMR as at 15/11/2020 10:00
>
> Good morning,
>
> Please see linked below the Queensland Emergency Management Report as at 15/11/2020 10:00.
>
> QEMR Link: https://www.disaster.qld.gov.au/dmp/QEMR/QEMR-as-at-1000hrs-15-November-2020.pdf
>
> If you require further information, please contact the Watch Desk as undersigned.
>
> Regards,
>
> State Disaster Coordination Centre | Watch Desk
> Queensland Fire & Emergency Services
> Level 2, State Disaster Management Centre, Kedron
> GPO Box 1425 Brisbane QLD 4001
> P: 07 3635 2387 (24hrs) | M: Personal inf
> F: 07 3357 4682 | E: sdcc@qfes.qld.gov.au<mailto:sdcc@qfes.qld.gov.au>
>
>

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Date : 12/11/2020 9:03:34 AM
From : "DARGUSCH Marc"
To : "LAVENDER Sven"
Cc : "EDMED Greg" , "DARGUSCH Anthony" , "TAPPLY Jenna" , "HARVEY Peter" , "YETMAN Brendon" , "CIR Fire Team"
Subject : RE: Fire Sth of Awiyna Firebreak requesting air support
Attachment : image001.png;image003.png;

Hi Sven – chopper assist approved (2/3hrs). Talked to Greg –he will call you and sort.

Regards, M

From: LAVENDER Sven <Sven.Lavender@des.qld.gov.au>
Sent: Thursday, 12 November 2020 8:59 AM
To: DARGUSCH Marc; EDMED Greg
Subject: Fire Sth of Awiyna Firebreak requesting air support

Hi,

See photo of fire at present, good chance to stop fire along western side of island with a bambi bucket. Fire is mainly burning along ridge on top of beach.

Ground crews location of fire is -25.084476 153.161604

Thanks,

Queensland Government

Sven Lavender
Ranger-in-Charge – K'gari (Fraser Island) North
Coastal and Islands Region / QPWS & Partnerships
Department of Environment and Science

P 07 41 279 138 Ext 9
Dundubara, Fraser Island
PMB 20 MS 2173
Rainbow Beach QLD 4581

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Date : 19/10/2020 12:40:58 PM
From : "HEAD Damien"
To : "DARGUSCH Marc" , "CUBIS Mick"
Subject : RE: RE: QF4-20-116117 Sitrep
Attachment : image001.png;image003.png;

Encouraging and great news.

From: DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au>
Sent: Monday, 19 October 2020 12:33 PM
To: CUBIS Mick
Cc: HEAD Damien
Subject: FW: RE: QF4-20-116117 Sitrep

Mick – Latest SitRep below. Will provide preferred Fire Management Plan including further IMT detail (with note QFES Liaison Officer in place at Dundy) this PM. QFES looking to run community meet mid-arvo for Orchid Beach Community. More info as it comes to hand.

Confirm following closed due to wildfire:

- Platypus and Wathumba tracks.
- Camping:
  - Zone 8 –Duling CZ (fire origin), Ocean Lake CZ & Marloo CZ.
  - Wathumba Camping Area.
  - Camp zones within stretch from Wathumba Creek to Awinya Creek.

Regards, M

From: KUSKIE James <James.Kuskie@des.qld.gov.au>
Sent: Monday, 19 October 2020 12:21 PM
To: DARGUSCH Marc; YETMAN Brendon; GREEN John; LAVENDER Sven
Cc: CIR Fire Team
Subject: RE: QF4-20-116117 Sitrep

As of 1200pm

Fire is still traveling in S direction and just got news from the spotter plane at 1200pm there is not a large fire front but a few small ones. In the past 4 hours it seems to have only moved south a further 100m.

We have 1 QPWS crew on site monitering the situation and 1 tractor removing fallen trees.

RFS are assisting in monitoring the situation from the township with 3 more units on route to assist from mainland. QFRES liaison officer are with IMT at Dundubara.

Queensland Government

James Kuskie
004 Ranger K'gari (Fraser Island) North
Coastal and Islands Region / QPWS & Partnerships
Department of Environment and Science

P 07 41 279 138 Ext 9
Dundubara, Fraser Island
PMB 20 MS 2173
Rainbow Beach QLD 4581

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Date : 16/11/2020 8:58:58 AM
From : "HEAD Damien"
To : "CUBIS Mick" , "CAMBOURN Neil"
Subject : RE: Smoke Hervey Bay

Fingers crossed for the rain. Look forward to hearin the tactics and objectives of the IMT at lunch time.

From: CUBIS Mick <Mick.Cubis@des.qld.gov.au>
Sent: Monday, 16 November 2020 8:55 AM
To: HEAD Damien; CAMBOURN Neil
Subject: RE: Smoke Hervey Bay

No, the wind eased up overnight and blew lightly from the SE. That is why there was a push to waterbomb yesterday afternoon.

The winds are forecast to go back to the north today and tomorrow, with a change due through on Wednesday. Possibility of some rain with the change, but doesn't look like there will be much rain.

Mick Cubis
Regional Director, Coastal and Islands Region
GBRMCI | QPWS & Partnerships
Department of Environment and Science

P: 07 54471137 M: Personal inf
240 Moorindil Street, Tewantin
Qld 4565
mick.cubis@des.qld.gov.au

From: HEAD Damien <Damien.Head@des.qld.gov.au>
Sent: Monday, 16 November 2020 8:40 AM
To: CUBIS Mick; CAMBOURN Neil
Subject: RE: Smoke Hervey Bay

That is great news means the change might be on its way through.

They will have to get ready for more if we light up.

From: CUBIS Mick <Mick.Cubis@des.qld.gov.au>
Sent: Monday, 16 November 2020 7:57 AM
To: CAMBOURN Neil; HEAD Damien
Subject: FW: Smoke Hervey Bay

FYI

Mick Cubis
Regional Director, Coastal and Islands Region
GBRMCI | QPWS & Partnerships
Department of Environment and Science

P: 07 54471137 M: Personal inf
240 Moorindil Street, Tewantin
Qld 4565
mick.cubis@des.qld.gov.au

From: DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au>
Sent: Monday, 16 November 2020 7:52 AM
To: CUBIS Mick
Cc: CIR Fire Team; SEELEITHER Jamie; MACDONALD Stirling
Subject: FW: Smoke Hervey Bay

Hi Mick – some political undertones worth noting (below email).

As per my email yesterday, I'll work with IMT to ensure a clear plan is brought together with view to presenting to ED and others. I'll re-engage with you once I get handle on plan to test details.

Regards, M

From: Andrew Marnie <Andrew.Marnie@qfes.qld.gov.au>
Sent: Monday, 16 November 2020 6:41 AM
To: DARGUSCH Marc
Subject: Smoke Hervey Bay

Good morning Marc

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The wind has turned SE overnight. Peter Hollier has rung to let me know that the Hervey Bay and Maryborough areas are covered in a think blanket of smoke

He has already received a phone call from the Mayor who is not too happy.

It may be worth passing this up the change given the Mayors interest and any possible fallout from that.

Regards

Andrew

Andrew Marnie
Bushfire Safety Officer
North Coast Region, Rural Fire Service
Queensland Fire and Emergency Services
Mobile: Personal inform

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Date : 19/10/2020 4:25:26 PM
From : "HEAD Damien"
To : "DARGUSCH Marc" , "CUBIS Mick"
Subject : RE: Tuesday 20Oct2020 fire management tactics
Attachment : image003.png;image004.png;image001.png;image002.png;
Marc

Burning tomorrow is also counter to QFERS very own report

Choose Wildfire or HRB
Wildfire Behaviour Guidance

3 Day Look Ahead - Daily Peak Wildfire Behaviour Guidance in the Vicinity of
FRASER ISLAND in NORTH COAST Region, MARYBOROUGH Rural Area assuming Heath & Shrubland Fuel

Monday, 19 October 2020	With a forecast peak daily fireline intensity of 8566kW/m in Heath using the Advanced Heath rate of spread model, Direct Attack on the head fire is potentially UNSAFE / backburning is potentially RISKY. Fire behaviour is likely to be a highly vigorous, rapidly spreading surface fire with an estimated peak daily forward rate of spread of 1764m/hr, exhibiting regular torching (or passive crown fire, with possible periodic crowning). Heath fuels are more resistant to changes in humidity and may continue to burn overnight and in high humidity. Heath is also a threshold fuel, which means it may not carry vigorous fire until the wind reaches a threshold, and then it can rapidly intensify and spread.
Tuesday, 20 October 2020	With a forecast peak daily fireline intensity of 10428kW/m in Heath using the Advanced Heath rate of spread model, Direct Attack on the head fire is UNSAFE / backburning is NOT ADVISED/EXTREMELY RISKY. Fire behaviour is likely to be a dangerous, extremely vigorous, very rapidly spreading surface fire with an estimated peak daily forward rate of spread of 2147m/hr, with the potential for active and long period crowning. Heath fuels are more resistant to changes in humidity and may continue to burn overnight and in high humidity. Heath is also a threshold fuel, which means it may not carry vigorous fire until the wind reaches a threshold, and then it can rapidly intensify and spread.
Wednesday, 21 October 2020	With a forecast peak daily fireline intensity of 8593kW/m in Heath using the Advanced Heath rate of spread model, Direct Attack on the head fire is potentially UNSAFE / backburning is potentially RISKY. Fire behaviour is likely to be a highly vigorous, rapidly spreading surface fire with an estimated peak daily forward rate of spread of 1769m/hr, exhibiting regular torching (or passive crown fire, with possible periodic crowning). Heath fuels are more resistant to changes in humidity and may continue to burn overnight and in high humidity. Heath is also a threshold fuel, which means it may not carry vigorous fire until the wind reaches a threshold, and then it can rapidly intensify and spread.

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From: HEAD Damien
Sent: Monday, 19 October 2020 4:05 PM
To: DARGUSCH Marc; CUBIS Mick
Subject: RE: Tuesday 20Oct2020 fire management tactics

If I had to burn off that line. North easterly to easterly would be better. A southernly would result in the ambers entering orchid beach.

From: DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au>
Sent: Monday, 19 October 2020 3:58 PM
To: CUBIS Mick
Cc: HEAD Damien
Subject: Tuesday 20Oct2020 fire management tactics

Hi Mick – I just spoke to the QFES Liaison Officer – he's very clear that for the purpose of protecting life and property we need to backburn on the Western side of Orchid Beach township once the southerly change has come through tomorrow. Thoughts are the lighting would start around 1pm tomorrow Tuesday 20Oct2020. The critical concern from QFES is ember attack on unattended houses in Orchid Beach and ensuring that there is an adequate 'break' between the township and a firefront that is highly likely to approach the town at some stage in the near future.

Whilst this tactic introduces further fire into this block, there will already be fire in the block which is further to the south of where the edge-lighting will stop tomorrow.

Let me know if you or others want to talk further.

Regards, Marc

Marc Dargusch
Principal Ranger – Great Sandy Area
Coastal and Islands Region | QPWS and Partnerships
Department of Environment and Science
M [redacted] P 07 54869960
Level 6, 12 on First Avenue, Maroochydore 4558
www.des.qld.gov.au
Queensland Government
I give my respect to the traditional and custodial Aboriginal and Torres Strait Island Elders and Owners of the Land in which I work, live and walk.

From: DARGUSCH Marc
Sent: Monday, 19 October 2020 2:18 PM
To: Andrew.Marnie@qfes.qld.gov.au
Subject: FW: RE: QF4-20-116117 FRASER ISLAND

Hi Andrew – I've just got this email through.

I'm not keen to put additional fire on ground if we don't have to. I'd like to understand QFES' needs – ***does this plan meet them ?*** and ***is it a strong desire of QFES that we put fire into this block at this timing*** for the purposes of life/property protection ?

Happy to talk detail.

Regards, Marc

From: KUSKIE James <James.Kuskie@des.qld.gov.au>
Sent: Monday, 19 October 2020 2:10 PM
To: DARGUSCH Marc
Subject: FW: RE: QF4-20-116117 FRASER ISLAND

From: KUSKIE James
Sent: Monday, 19 October 2020 9:50 AM
To: DARGUSCH Anthony; YETMAN Brendon; LAVENDER Sven; HARVEY Peter; Andrew.Marnie@qfes.qld.gov.au
Cc: CIR Fire Team
Subject: RE: QF4-20-116117 FRASER ISLAND

Proposed plan for Tuesday.

Attached is the latest plan for the wildfire Kgari North.

We are planning to put a proposed back burn in around the back of Orchid Beach township down to Middle rocks to act as a buffer area if the winds push the fire back towards the town. All predictions from QFRES show that the fire will be in the Eastern side of the exploration block by tonight which is expected. A fly over the area at 11am will shine more light on the subject.

Starting from AA on the map and working S we will have one light up crew and 7 support crews with the Rainbow tanker in support at the Waddy dump area.

Wind forecast is for SE winds on Tuesday so light up will commence at 100pm and working around to approx. 6pm depending on conditions on the ground. Blacking out will be followed up with crews until safe edge established.

Crews will be 5 Rural crews and 3 QPWS crews with QPWS tanker at Waddy dump used as water point.

If you have any further questions just give me call.

Thanks.

Queensland Government

James Kuskie
004 Ranger K'gari (Fraser Island) North
Coastal and Islands Region / QPWS & Partnerships
Department of Environment and Science

P 07 41 279 138 Ext 9
Dundubara, Fraser Island
PMB 20 MS 2173
Rainbow Beach QLD 4581

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Date : 16/11/2020 2:28:28 PM
From : "HEAD Damien"
To : "CUBIS Mick" , "DARGUSCH Marc"
Cc : "CAMBOURN Neil" , "SPINKS Troy" , "MCLAUGHLIN Marty"
Subject : RE: Two K'gari fire interview requests
Attachment : image001.png;image003.png;image004.png;image005.png;
perfect

From: CUBIS Mick <Mick.Cubis@des.qld.gov.au>
Sent: Monday, 16 November 2020 2:27 PM
To: HEAD Damien; DARGUSCH Marc
Cc: CAMBOURN Neil; SPINKS Troy; MCLAUGHLIN Marty
Subject: RE: Two K'gari fire interview requests

Marty has offered to be the spokesperson, but we will need to provide background and latest on the situation. Troy and Marty will join the meeting this afternoon.

Mick Cubis
Regional Director, Coastal and Islands Region
GBRMCI | QPWS & Partnerships
Department of Environment and Science
P: 07 54471137 M: Personal Info
240 Moorindil Street, Tewantin
Qld 4565
mick.cubis@des.qld.gov.au

From: HEAD Damien <Damien.Head@des.qld.gov.au>
Sent: Monday, 16 November 2020 2:11 PM
To: DARGUSCH Marc; CUBIS Mick
Cc: CAMBOURN Neil
Subject: FW: Two K'gari fire interview requests

A talking head or someone recording a few minutes to an iphone AM and PM on an update is what is they are after and should suffice all requests.

The enquires are not about to go away as we put smoke over HB and Bundaberg in the coming days.

I have said no to the WIN TV one below.

Ben K has now directly asked that we attend to this increasing pressure for doing media. So we need to craft a low resource solution to appease the media but just as much the anxious public and visitors.

Damien

From: Media DES <Media@des.qld.gov.au>
Sent: Monday, 16 November 2020 1:05 PM
To: HEAD Damien
Cc: Media DES
Subject: Two K'gari fire interview requests

Hi Damien,

We have two interview requests regarding the K'gari fire.

The first one is quite urgent - WIN Sunshine Coast would like an on-camera interview ASAP.

Secondly, ABC Wide Bay would like an on-air interview at 7.15am tomorrow morning.

As anyone free to do these?

Thanks,
Emma

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Emma O'Connor
Senior Media Officer
Media Unit | Corporate Communications
Department of Environment and Science

P 07 3339 5831 Chat with me on Teams!
E Emma.OConnor@des.qld.gov.au
Level 31, 400 George St, Brisbane
Visit the Environment Media Centre
Visit us on Twitter

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Date : 14/10/2020 3:58:09 PM
From : "HEAD Damien"
To : "CAMBOURN Neil" , "TRACEY Alena" , "Media DES"
Cc : "DARGUSCH Marc" , "CUBIS Mick"
Subject : RE: URGENT: Fraser Is fire tweet
Attachment : image001.png;image009.png;image012.png;image013.png;image002.png;image003.png;image004.png;image007.png;

The team have confirmed

- The fire started from an escaped illegal campfire. The responsible campers had vacated and have not been identified.
- The fire poses no immediate threat to life/property. Fire Danger Index suggests low intensity.
- Fire is in a remote section of the island. North of orange creek, south of Ngkala Rocks. (north of Orchid Beach Township).
- QPWS will monitor the fire however will not be taking any action to control or contain.
- Three camps in the adjacent beach camping zone are in the process of being relocated as a precaution.
- Key points relayed to media team.

From: CAMBOURN Neil <Neil.Cambourn@des.qld.gov.au>
Sent: Wednesday, 14 October 2020 3:50 PM
To: TRACEY Alena; HEAD Damien
Subject: RE: URGENT: Fraser Is fire tweet

You're welcome. We will keep you up to date once Damien hears back from the guys.

Neil Cambourn
Assistant Director-General
Queensland Parks and Wildlife Service and Partnerships
Department of Environment and Science
P 07 3199 7518 M Personal info
Level 5, 400 George Street, Brisbane QLD 4000
Queensland Government

From: TRACEY Alena <Alena.Tracey@des.qld.gov.au>
Sent: Wednesday, 14 October 2020 3:49 PM
To: CAMBOURN Neil
Subject: RE: URGENT: Fraser Is fire tweet

Thanks heaps

From: CAMBOURN Neil <Neil.Cambourn@des.qld.gov.au>
Sent: Wednesday, 14 October 2020 3:47 PM
To: TRACEY Alena
Cc: MERRICK Jamie; KLAASSEN Ben
Subject: RE: URGENT: Fraser Is fire tweet

Hi Alena,
I was only alerted a few minutes ago by Andrea Grant.
It is on the PSBA website as per below.
It is at Ngkala Rocks area between Orchid Beach and Sandy Cape so miles from anywhere and not a threat to anything – likely a campfire escape. There wouldn't be many people camping all the way up there I wouldn't think either.
The drought index at the moment up there is quite low (68 at Eurong) meaning plenty of moisture still in the ground, so its probably not likely to go far.
Damien is checking in with Mick and Marc now.

STAY INFORMED - Fraser Island vegetation fire as at 2:55pm Wed 14 Oct

14th October 2020 2:55 PM

Bushfire warning level: ADVICE

Queensland Fire and Emergency Services (QFES) advises there is a vegetation fire burning on Fraser Island.

You need to **keep up to date** and **decide what actions you will take** if the situation changes.

Currently as at 2:55pm Wednesday, 14 October 2020, a vegetation fire is burning near Ngkala Rocks and Orange Creek travelling in a northwesterly direction.

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Rural Fire Service and National Parks fire crews are on scene attempting to contain the fire.

Rangers are in the process of relocating campers to a safe location.

People in the area will be affected by smoke, which will reduce visibility and air quality.

Properties are not under direct threat at this time. Call Triple Zero (000) immediately if you believe you or your property is under threat.

WHAT YOU SHOULD DO:
• Listen to your local radio station or visit the Rural Fire Service (RFS) website for regular updates.
• If you have a bushfire survival plan, refer to it now and be ready to follow it.
• If you do not have a bushfire survival plan, or if your plan is to leave, identify where you will go if the situation changes.
• Close windows and doors to minimise smoke exposure.
• If you suffer from a respiratory condition, keep your medication close by.
• Drive with caution in low visibility conditions.
• Contact your neighbours to see if they need help preparing for the bushfire.
• Consider finding your essential items (e.g., identification documents, prescription medication, food and water, and protective clothing such as a long-sleeved cotton shirt and trousers, and boots) in case you need to leave.
• Consider what you will do to protect your pets and livestock.
• Drink plenty of water to stay hydrated.
• Advise family and friends of your intended actions if the situation changes.

KEEP UP TO DATE BY:
• Following QFES on Facebook (@QldFireandEmergencyServices) and Twitter (@QldFES)
• Staying tuned to your local radio station. Find your local ABC radio station at https://radio.abc.net.au/help/offline and your local commercial radio station at http://www.commercialradio.com.au/find-a-station/queensland;
• Visiting the Rural Fire Service (RFS) website at www.ruralfire.qld.gov.au/map

FURTHER INFORMATION:
• For bushfire preparation tips, visit the RFS website: www.ruralfire.qld.gov.au/BushFire_Safety
• For information about road closures, call 13 19 40 or visit www.qldtraffic.qld.gov.au

The next update will be provided when the situation changes.

Queensland Government

Neil Cambourn
Assistant Director-General
Queensland Parks and Wildlife Service and Partnerships
Department of Environment and Science
P 07 3199 7518 **M** Personal info
Level 5, 400 George Street, Brisbane QLD 4000

From: TRACEY Alena <Alena.Tracey@des.qld.gov.au>
Sent: Wednesday, 14 October 2020 3:34 PM
To: CAMBOURN Neil
Cc: MERRICK Jamie
Subject: FW: URGENT: Fraser Is fire tweet
Importance: High

Hi Neil

Do you have any further detail on the fire?

Thanks
Alena

From: DLO DES <DLO.DES@des.qld.gov.au>
Sent: Wednesday, 14 October 2020 3:33 PM
To: TRACEY Alena
Cc: TONES Peter; MERRICK Jamie
Subject: FW: URGENT: Fraser Is fire tweet
Importance: High

Hi Alena – the department would like to send the below tweet out:
Due to a vegetation fire on K'gari (Fraser Island) we are moving campers in the Ngkala Rocks & Orange Creek areas to a safe location. People will be affected by smoke which will reduce visibility & air quality. @QldFES

For further backgrounds, there are three camp sites. Two are being cleared right now & the third – the group is off on a hike still.

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For approval please,
Thanks Raylene

Raylene Orellana
Departmental Liaison Officer
Office of the Director-General
Department of Environment and Science

Ph: 3330 6271
raylene.orellana@des.qld.gov.au | Level 32, 1 William Street, Brisbane

We will make a difference
Let's end domestic and family violence

From: DAVIDSON Brent <Brent.Davidson@des.qld.gov.au>
Sent: Wednesday, 14 October 2020 3:26 PM
To: DLO DES
Subject: URGENT: Fraser Is fire tweet
Importance: High

Hi DLOs

Our friends at QFES Media have given us a heads up about this & the info has been confirmed by QPWS. As part of our public safety information function, would like to tweet the following:

Due to a vegetation fire on K'gari (Fraser Island) we are moving campers in the Ngkala Rocks & Orange Creek areas to a safe location. People will be affected by smoke which will reduce visibility & air quality. @QldFES

For further backgrounds, there are three camp sites. Two are being cleared right now & the third – the group is off on a hike still.

Brent

Brent Davidson
Media Manager
Media Unit | Corporate Communications
Department of Environment and Science

Chat with me on teams **M** Personal info
E brent.davidson@des.qld.gov.au
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Date : 15/11/2020 4:51:12 PM
From : "HEAD Damien"
To : "DARGUSCH Marc"
Cc : "CUBIS Mick" , "SEELEITHER Jamie" , "CIR Fire Team" , "MACDONALD Stirling"
Subject : Re: Use of Retardant.

Marc

Given the aerial mapping isn't back in. It would be worth having that on hand to understand progress to date and threats (appears to be minimal change based on sit rep) along with the modelling and weather forecasts. I am assuming life and property is not at immediate risk and the ecological impacts are not broad or severe either. All this would inform any aerial support decision.

There is tomorrow given minimal change. Suggest if necessary and on offer is a briefing of the executives by the IMT and QFES if you feel that would be beneficial to any party in getting clarity.

It is an offer. If so around tomorrow lunch would work best. Have all the data and time in the afternoon to implement.

Damien

Sent from my iPhone

> On 15 Nov 2020, at 1:03 pm, DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au> wrote:
>
> QFES Rotary AirSurvey just confirmed for 1500 today with live stream. Should have mapping by 1530.
>
> M
>
> ---
>
> **From:** DARGUSCH Marc
> **Sent:** Sunday, 15 November 2020 1:02 PM
> **To:** CUBIS Mick
> **Cc:** HEAD Damien; SEELEITHER Jamie; CIR Fire Team; MACDONALD Stirling
> **Subject:** FW: Use of Retardant.
>
> Mick – got txt, thanks. You must be still travelling.
>
> Heads up that QFES are putting together plan to lay gel line from West to East late this afternoon to time with lowered fire intensity with view to putting out south/west sector. Looking to utilise the LAT DAK8 aircraft which holds 10000 litres and is effective over 300m at each drop – also looking to engage fixed wing 802s which carry 3000 litres effective over 75m to fill in. It is likely that QPWS will not wear any cost but …. that could not be confirmed as planning currently at high levels of QFES.
>
> I believe this option will be delivered at high level DES/Ministerial level.
>
> …. I'm just passing on a message. No doubt more to come in writing from varying levels.
>
> Regards, M
>
> ---
>
> **From:** CUBIS Mick <Mick.Cubis@des.qld.gov.au>
> **Sent:** Sunday, 15 November 2020 12:52 PM
> **To:** DARGUSCH Marc
> **Cc:** CIR Fire Team; SEELEITHER Jamie; MACDONALD Stirling; BARRACLOUGH Emma
> **Subject:** Re: Use of Retardant.
>
> Marc, I've sent you a text. Neil has approved if it is required to protect life and property.
>
> Sent from my iPhone
>
> > On 15 Nov 2020, at 12:06 pm, DARGUSCH Marc <Marc.Dargusch@des.qld.gov.au> wrote:

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Hi Mick – See the below email interaction. I believe I've exhausted RCC resources in attempting to clarify gel use. Is there anyone in the State Team that we could flick this to ?

Regards, Marc

From: DARGUSCH Marc
Sent: Sunday, 15 November 2020 12:02 PM
To: Andrew Marnie
Cc: Peter Hollier; rfsq northcoast; LAVENDER Sven; EDMED Greg
Subject: RE: Use of Retardant.

Thanks Andrew – I'll start digging although, QFES has already been given the okay to utilise gel by our RD if it is related to the protection of life and property on K'gari.

Regards, Marc

Marc Dargusch
Principal Ranger – Great Sandy Area
Coastal and Islands Region | QPWS and Partnerships
Department of Environment and Science
M Personal in **P** 07 54869960
Level 6, 12 on First Avenue, Maroochydore 4558
www.des.qld.gov.au
I give my respect to the traditional and custodial Aboriginal and Torres Strait Island Elders and Owners of the Land in which I work, live and walk.

From: Andrew Marnie <Andrew.Marnie@qfes.qld.gov.au>
Sent: Sunday, 15 November 2020 11:58 AM
To: DARGUSCH Marc; EDMED Greg
Cc: Peter Hollier; rfsq northcoast; LAVENDER Sven
Subject: FW: Use of Retardant.

Good morning Marc and Greg,

To assist with clarifying the QPWS permission to use Gel for aerial suppression of the K'Gari Fire I have been forwarded the attached emails.

The original email is from Nigel Holmes, the DES Principal Senior Adviser Incident Management Central Qld, and confirmed he had reached sign off on the DES Procedural Guide for the use of Bushfire Fighting Agent including Gel. It has been forwarded to us by the QFES State Air Operations Coordinator.

To ensure the K'Gari ICC (QPWS and QFES) is able to request the use of gel as an option would you be able to follow through with this and confirm that we are able to use gel iaw with the DES Guide attached.

There may be a window of opportunity later this afternoon. I am currently working with Peter Hollier to develop a suggested strategy should that opportunity be confirmed. The ability to use gel is pivotal.

Your support in this matter is appreciated

Regards

Andrew

Andrew Marnie
Bushfire Safety Office
North Coast Region
Queensland Rural Fire Service

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From: CONNOR Nathan <Nathan.Connor@des.qld.gov.au>
Sent: Friday, 15 May 2020 08:22
To: Brett McIlwaine <Brett.McIlwaine@qfes.qld.gov.au>; Martin Gibson <Martin.Gibson@qfes.qld.gov.au>
Cc: MCLAUGHLIN Marty <Marty.McLaughlin@des.qld.gov.au>
Subject: RE: Use of Retardant.

Hi Marty and Brett,

Again, thank you for your proactive approach to have this question considered before we all get too busy and it becomes difficult. As mentioned on the phone, our DES colleagues have provided a comprehensive procedural guide to assist us with making decisions regarding the use of retardant and other suppressants on our protected area estate. I have attached the **DRAFT** procedural guide for your reference – I will confirm in writing when this document has received sign off.

Summary points relating to specific queries below in red text.

If you have any questions please do not hesitate to call.

Nathan

Nathan Connor
Principal Conservation Officer - Fire
Technical Services
Queensland Parks and Wildlife Service
Department of Environment and Science
M Personal in

From: Brett McIlwaine <Brett.McIlwaine@qfes.qld.gov.au>
Sent: Monday, 6 April 2020 11:10 AM
To: CONNOR Nathan
Subject: RE: Use of Retardant.

Hi Nathan,
Many thanks for the chat. I am trying to get ahead of the game for the upcoming fire season, and as you have undoubtably heard we will have a Large Air Tanker at our disposal from this point forward for a number of years. Having said that, I am writing to seek approval from QPWS for the use of retardant on your land, with whatever stipulations you need to put in place from this point forward. QFES is looking at introducing retardant into the fold this season. I know that in the past we have sort approval for Blazetamer, and that it is approved for use. I don't believe we would use a lot of retardant around on QPWS land, however if we get approval in advance it will cut down the response time of aircraft, when the use is required. It will most likely be used very strategically due to the cost, and I believe would mainly be used to box in a fire in its incipient stage, especially if it were in inaccessible terrain. The two types of retardant are the ones I discussed, please see below;

- Phos-Check MVP-FX (mixed from a powder)
- Phos-Check LC95 (liquid concentrate)

Where there are particular values present in an area the pros-and-cons of retardant use, mitigation measures or avoidance areas will need to be considered on an individual basis in the context of the particular threats posed by the fire and/or retardant use including:

- Sensitive, rare or threatened flora, fauna, or habitats are present.
- Proximity of sensitive waterways (e.g., dry-season refuge pools for aquatic species).
- Cultural resources, historic properties or sacred sites.
- Very large volumes of retardant is spilled or applied in one location that could impact the adjacent values.

It is assumed that fire retardant would only be used when the fire front is about to overtake an area with the result of full involvement and possible severe damage to or loss of infrastructure, environmental or other values. **On that basis, a net impact-versus-benefit analysis would be heavily in favour of retardant use given the fire protection benefits versus the much lower risk of related adverse and probably temporary effects.**

In some circumstances there may be a low risk of temporary acute effects on sensitive flora or fauna from retardant use such as:

- Photosynthesis inhibition from colouring agents on leaves, especially non-degradable iron oxide pigments that may permanently stain leaf surfaces.

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- Leaf scalding on sensitive species from the retardant components, degradation products or use of non-potable water such as seawater (e.g., ferns and orchids).
- Tainting of resources such as food items consumed by wildlife.

Given the likely conditions during a fire would be extended hot, dry weather, retardant is unlikely to be taken up significantly by the foliage of plants, as the stomata on their leaves are likely to be closed to prevent water loss. Similarly, the long molecular chains of the polyphosphates are likely to be too big to be adsorbed through the leaf surfaces.

Key recommendation;

As a precaution against long-term staining of long-lived or sensitive leafage that may inhibit photosynthesis, (e.g., cycads and Xanthorrea), and to prevent aesthetic visual staining of vegetation or infrastructure, especially on Parks estate, it should be specified that:

- **Retardants containing iron oxide colourants are not to be used as they may cause long-term staining.**
- **Only retardants with fugitive (biodegradable) colourants are to be used.**

For example, a retardant that that is described as containing a fugitive colourant, that will slowly fade during exposure to sunlight would be suitable and not result in significant effects.

And just for good measure as I know this come up;

- The use of saline water from brackish or seawater sources for firefighting are unlikely to have significant adverse effects, as application will be spread over a wide area as only a minor contribution to natural soil salts levels.

Further advice on BlazeTamer is included within the guide.

As mentioned we are currently seeking approval from SEQWater as well. I have spoken with NSWRFS and they currently have approvals from department of Environment, WaterNSW and SA Water.

If you could look at approving these products in advance, it would be much appreciated.

Kind regards

Brett

Brett Mcilwaine
Air Operations Officer

State Air Operations Unit
Fire and Rescue Service Directorate
Queensland Fire and Emergency Services

Phone: (07) 3635 2491
Mobile: Personal infor
Email: brett.mcilwaine@qfes.qld.gov.au

***Note: for aircraft tasking, please contact State Air Desk on (07) 3635 1400 or qfes.stateairdesk@qfes.qld.gov.au*

From: CONNOR Nathan <Nathan.Connor@des.qld.gov.au>
Sent: Monday, 6 April 2020 10:43
To: carly.frost <carly.frost@des.qld.gov.au>; Brett McIlwaine <Brett.McIlwaine@qfes.qld.gov.au>; KILLEN Tim <tim.killen@des.qld.gov.au>
Cc: Fire Advice <Fire.Advice@des.qld.gov.au>; EDMED Greg <Greg.edmed@des.qld.gov.au>
Subject: RE: Joint Training opportunity between QFES and QPWS.

Hi Carly and Brett,

Yes and apologies for the tardy reply. Brett my number is Personal inf if you want a chat.

Regards,

Nathan

From: FROST Carly <Carly.Frost@des.qld.gov.au>
Sent: Monday, 6 April 2020 10:37 AM
To: Brett McIlwaine; CONNOR Nathan; KILLEN Tim
Cc: Fire Advice; EDMED Greg
Subject: RE: Joint Training opportunity between QFES and QPWS.

Hi Brett,

I apologise that no one has responded, this is definitely something we need to sort before next wildfire season

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I will forward your email on again. Nathan are you the appropriate contact for this?

Please let me know if this isn't followed up

Thanks

Carly

Carly Frost
Ranger- Fire, Pest and Firearms Management
Technical Support – Coastal and Islands Region
Queensland Parks and Wildlife Service and Partnerships
Department of Environment and Science
P 07 3164 3613 | **M** Personal info | **E** Carly.Frost@des.qld.gov.au
60 Mt Nebo Rd | The Gap
cid:image008.png@01D32177.B135E340

From: Brett McIlwaine <Brett.McIlwaine@qfes.qld.gov.au>
Sent: Monday, 6 April 2020 10:29 AM
To: FROST Carly
Subject: FW: Joint Training opportunity between QFES and QPWS.

Hi Carly,
Hope you had a great weekend…..just a quick email to follow up on the below as I have not heard anything yet. Would you be able to chase it up for me or get me the contact details of someone that I could call.

Many thanks

Brett

Brett McIlwaine
Air Operations Officer

State Air Operations Unit
Fire and Rescue Service Directorate
Queensland Fire and Emergency Services

Phone: (07) 3635 2491
Mobile: Personal info
Email: brett.mcilwaine@qfes.qld.gov.au

***Note: for aircraft tasking, please contact State Air Desk on (07) 3635 1400 or qfes.stateairdesk@qfes.qld.gov.au**

From: Brett McIlwaine
Sent: Thursday, 19 March 2020 15:37
To: FROST Carly <Carly.Frost@des.qld.gov.au>
Subject: RE: Joint Training opportunity between QFES and QPWS.

Hi Carly,
I am hoping that you may be able to assist me, I am after a contact with QPWS that I can talk to about the use of retardant / GEL, on QPWS land. I am trying to seek permission prior to the next fire season so that it cuts delay in response of aircraft and the products there can drop.

Thanks in advance…

Brett

Brett McIlwaine
Air Operations Officer

State Air Operations Unit
Fire and Rescue Service Directorate
Queensland Fire and Emergency Services

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Phone: (07) 3635 2491
Mobile: Personal info
Email: brett.mcilwaine@qfes.qld.gov.au

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From: FROST Carly <Carly.Frost@des.qld.gov.au>
Sent: Thursday, 23 January 2020 08:55
To: Wesley Bruce <Wesley.Bruce@qfes.qld.gov.au>; Clinton Neumann <Clinton.Neumann@qfes.qld.gov.au>
Cc: Brett McIlwaine <Brett.McIlwaine@qfes.qld.gov.au>; Martin Gibson <Martin.Gibson@qfes.qld.gov.au>
Subject: RE: Joint Training opportunity between QFES and QPWS.

Hi Wesley and Brett,

Thanks for getting back to me, that is fantastic news.

We have two events running, one at Bribie Island 5th - 6th of May and Rainbow Beach 12th -13th May.

I am meeting with Clinton Neumann next week to progress planning, so we should have further details for you soon.

I will be in touch,

Thanks

Carly

Carly Frost
Ranger- Fire, Pest and Firearms Management
Technical Support – Coastal and Islands Region
Queensland Parks and Wildlife Service and Partnerships
Department of Environment and Science
P 07 3164 3613 | **M** Personal in | **E** Carly.Frost@des.qld.gov.au
60 Mt Nebo Rd | The Gap
cid:image008.png@01D32177.B135E340

From: Wesley Bruce <Wesley.Bruce@qfes.qld.gov.au>
Sent: Thursday, 23 January 2020 6:47 AM
To: Clinton Neumann; FROST Carly
Cc: Brett McIlwaine; Martin Gibson
Subject: RE: Joint Training opportunity between QFES and QPWS.

Hi Carly,

The Air Operations unit would be more than happy to attend the training refresher. Please forward any further information as it comes to hand re: Date, Times and Content to be delivered.

We look forward to working with you.

Brett McIlwaine will be the best contact for this, I have CC'd him into the email.

Many thanks

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Wez

Wesley Bruce
Acting Inspector
Manager Air Operations

State Air Operations Unit
Fire and Rescue Service Directorate
Queensland Fire and Emergency Services

Mobile: Personal info
Email: wesley.bruce@qfes.qld.gov.au

***Note: for aircraft tasking, please contact State Air Desk on (07) 3635 1400 or qfes.stateairdesk@qfes.qld.gov.au*

From: Clinton Neumann
Sent: Tuesday, 21 January 2020 3:06 PM
To: Wesley Bruce <Wesley.Bruce@qfes.qld.gov.au>
Subject: Fwd: Joint Training opportunity between QFES and QPWS.

Clinton Neumann

From: FROST Carly <Carly.Frost@des.qld.gov.au>
Sent: Tuesday, January 21, 2020 1:10:27 PM
To: Martin Gibson <Martin.Gibson@qfes.qld.gov.au>; Brett McIlwaine <Brett.McIlwaine@qfes.qld.gov.au>
Cc: Clinton Neumann <Clinton.Neumann@qfes.qld.gov.au>; KINGSTON Barbara <Barbara.Kingston@des.qld.gov.au>; BLAKE Gemma <Gemma.Blake@des.qld.gov.au>
Subject: RE: Joint Training opportunity between QFES and QPWS.

Hi Martin and Brett,

Just following up from Gemma's last email.

As Gemma has recently been seconded outside the region, I am assisting with coordinating our Fire Refresher events. Could you please let me know if you are interested and your team has capacity to participate in early May?

Thanks

Carly

image002

Carly Frost
Ranger- Fire, Pest and Firearms Management
Technical Support – Coastal and Islands Region
Queensland Parks and Wildlife Service and Partnerships
Department of Environment and Science
P 07 3164 3613 | **M** Personal info | **E** Carly.Frost@des.qld.gov.au
60 Mt Nebo Rd | The Gap

cid:image008.png@01D32177.B135E340

From: BLAKE Gemma <Gemma.Blake@des.qld.gov.au>
Sent: Tuesday, 7 January 2020 4:04 PM
To: Martin Gibson; Brett McIlwaine
Cc: FROST Carly; Clinton Neumann; KINGSTON Barbara
Subject: Joint Training opportunity between QFES and QPWS.

Hi Martin and Brett,

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It was good to see you both in the SOC the other week and I hope you both managed to have some kind of rest over Christmas. As discussed the QPWS, Coastal and Island Region is currently organising a fire training refresher program for early May 2020 and we are seeking your interest and availability to participate (hopefully we have all somewhat recovered from this year's fire season by then).

We have planned two events in May (at Rainbow Beach and Bribie Island) with the purpose of:

1. covering and practicing key skills and safety issues relevant to the fire ground
2. provide firefighters/ staff with the opportunity to ask questions and generate discussion
3. enhance the knowledge and understanding of fire ground operations making safer and more professional firefighters.
4. Provide an opportunity for staff to network and co-ordinately with both other management units from across the region and with external agencies such as QFES, QYAC and BAC
5. provide mentoring opportunities from highly experienced fire personal from across and outside of the region.

To date we have liaised with Clinton Newman as we ultimately hope to coordinate a multiagency exercise as part of the program. This exercise is to be run as a level two incident with full interagency IMT running event out of QFES tango or sierra units (suggested by Clinton). Multi agency strike teams to be assembled and deployed to various exercises.

Proposed Exercises include:

1. Communications with State Air ops– How to communicate/ feedback to pilot etc. (It has been suggested that it may be possible to coordinate your air observer or bombardier training with these events to mutually benefit both departments in simulating communication exercises between QPWS ground crews and QFES aircraft).
2. Fire ecology based walk through- why and how to burn coastal heath for optimum outcomes walk through of local country.
3. Burn over scenario
4. Property protection scenario
5. Fire stick/ traditional burning techniques and other ignition strategies.

This event has full support from our regional leadership team and has been approved for funding through our Enhanced Fire Management Initiative. I am working with Carly Frost to coordinate the event (due to recently being seconded outside of the region) and hope to continue liaison with Clinton over the coming weeks. Please let us know if you are interested in participating in this initiative and if your team has the capacity to be involved to some extent in early May.

Regards,

image007

Gemma Blake
A/Senior Conservation Officer – Pest Management
Technical Services I Park Services I QPWS & Partnerships
Department of Environment and Science

P 07 3199 7649 **E** gemma.blake@des.qld.gov.au
Level 5, 400 George Street BRISBANE QLD 4000

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<mime-attachment>
<IRPG2-20BushfireAgentsV1-6Draft.docx>

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Date : 15/11/2020 11:41:11 AM
From : "Brett McIlwaine"
To : "Peter Hollier"
Subject : FW: Use of Bushfire firefighting agents DES Procedural Guide 2.20
Attachment : IRPG2-20BushfireAgentsV5-1.pdf;IRU-BushfireAgentsSummary.pdf;image002.png;image003.jpg;image004.png;

Hi Peter,
Here is the finalised version, and the email trail.

Kind regards

Brett

Brett McIlwaine
Air Operations Officer
Operations & Compliance

Queensland Government

State Air Operations Unit
Fire and Rescue Service Directorate
Queensland Fire and Emergency Services

Phone: (07) 3635 2491
Mobile: Personal info
Email: brett.mcilwaine@qfes.qld.gov.au

***Note: for aircraft tasking, please contact State Air Desk on (07) 3635 1400 or qfes.stateairdesk@qfes.qld.gov.au**

From: Martin Gibson <Martin.Gibson@qfes.qld.gov.au>
Sent: Thursday, 20 August 2020 18:01
To: Brett McIlwaine <Brett.McIlwaine@qfes.qld.gov.au>
Subject: FW: Use of Bushfire firefighting agents DES Procedural Guide 2.20

FYI

Martin Gibson BEng(Aero), BAviation
A/ Superintendent
Executive Manager, State Air Operations

Queensland Government

State Air Operations Unit
Fire and Rescue Service Directorate
Readiness and Response Division
Queensland Fire and Emergency Services

Phone: (07) 3635 2490
Mobile: Personal info
Email: martin.gibson@qfes.qld.gov.au

From: HOLMES Nigel <Nigel.Holmes@des.qld.gov.au>
Sent: Thursday, 20 August 2020 4:05 PM
To: CONNOR Nathan <Nathan.Connor@des.qld.gov.au>; Martin Gibson <Martin.Gibson@qfes.qld.gov.au>
Cc: MCLAUGHLIN Marty <Marty.McLaughlin@des.qld.gov.au>; BROOK Scott <Scott.Brook@des.qld.gov.au>; ATKINSON John <John.Atkinson@des.qld.gov.au>; GRIINKE Shari <Shari.Griinke@des.qld.gov.au>; RFSQ Rockhampton <RFSQ.Rockhampton@qfes.qld.gov.au>
Subject: RE: Use of Bushfire firefighting agents DES Procedural Guide 2.20

Greetings All

At long last I have a sign-off on the final Bushfire firefighting agent Procedural Guide for use in Queensland.
It was worth the wait in some respects as the Guide now has some permanence in our systems and has a guaranteed distribution to DES officers who need to know or may be asked for advice 24/7 during an emergency.

- Any queries can be directed to me or through the Pollution Hotline to State incident response on-call officers 24/7.
- This particular PG is more detailed than usual to ensure that it is a single point of reference against which any queries about use of current or proposed products can be resolved without delay or additional text or misinterpretation.

For content form the PG that has been or is being incorporated into other operational advice nothing significant has changed since the last draft.

Regards

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Nigel Holmes
Principal Advisor Incident Management
Central Queensland
Incident Response Unit | Environmental Services & Regulation
Queensland Department of Environment and Science

Pollution Hotline: 1300 130 372
Phone 07 4936 0503 **Mobile** Personal Information **Satellite** 0147 157 660
61 Yeppoon Road, North Rockhampton QLD 4701
PO Box 3130, Red Hill Rockhampton QLD 4701

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2.20 – Use of bushfire firefighting agents

This Guideline provides guidance, explanation and information to assist staff in the completion of specific tasks or in making certain judgments in the interpretation or application of standards used by the Department of Environment and Science in assessing compliance with standards related to environmental and regulatory requirements. This Guideline is for internal use only but may be referenced as the basis for a decision.

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Purpose and scope

This document guides personnel on the issues to consider in bushfires for the use of firefighting agents on Parks estate and more broadly for vegetation fires across Queensland. The purpose of this Procedural Guide is to pre-inform and facilitate decision-making on the use and response measures for firefighting agents in controlled burns and in emergencies. Products in use or proposed for use in Queensland are referenced but *this is not an endorsement or recommendation of any product*. This Procedural Guide does not cover the use of firefighting agents on industrial chemicals or liquid fuel fires such as oils, diesel, petrol, solvents or alcohol that are Class B fires.

Background

A variety of agents variously described as fire retardants, suppressants, water enhancers and firefighting foams are utilized in bushfires (rural) and rural-urban interface (i-zone) firefighting, in addition to, or to enhance the use of water [1]. These agents may be applied to the fire ground using methods including aerial fixed-wing tankers, helicopters and ground appliances. The composition of these agents influences both their behaviour in a fire and the potential environmental effects of unburned residues and decomposition products.

Most products currently in use for bushfire firefighting are of very low risk to the environment from their normal application or from their residues and breakdown products. However, the compositions of products and their use in each scenario need to be considered to assess the potential for adverse environmental effects on sensitive receptors and to assess whether mitigation measures are needed. This Procedural guide covers those classes and brands of agents that are in use or are proposed for bushfire firefighting in Queensland.

In assessing particular products, it is worth noting that safety data sheets (SDS) for many products can be unreliable, inadequate and even misleading and so should not be relied upon as the main source of product information and effects. The SDS for many chemicals including firefighting products can be particularly deficient in information relevant to environmental issues. However, provided there is sufficient information on product composition and effects from the SDS and other sources, an adequate assessment can be made of the potential risks to the environment, and how the risks should be managed.

Overall, the use of bushfire firefighting agents under normal application conditions of low concentrations spread along fire fronts is unlikely to have any long-term adverse environmental effects with a very low probability of significant acute short-term effects on the areas of application.

The main, but unlikely, risk from fire retardants, suppressants and foams is from concentrate spills or localised dumping that may then enter an enclosed waterway of limited volume, such as a billabong or pool of limited water volume that can be the dry-season refuge for many aquatic species and are particularly sensitive to upsets. Where there is limited dilution and flushing there is the potential for sufficient concentrations of contaminants to cause a fish-kill due to acute toxicity effects or dissolved oxygen depletion from biochemical oxygen demand (BOD) as organic components decay.

There is also the potential for fish-kills and environmental disruption in waterways from the delayed promotion of algal blooms, e.g., by nitrogen and phosphorous nutrient effects, that can lead to eutrophication and related dissolved oxygen depletion. As handling of large volumes of firefighting agents will usually be under controlled conditions at facilities away from the fire and sensitive environments this risk can be easily managed.

This Procedural Guide refers to three main groups of firefighting agents used in bushfire firefighting and control. Details of product compositions and environmental characteristics are given as a ready reference in case situations arise when further urgent assessment is needed. While some products crossover in their firefighting functions, the main classes of agents are:

Section 1 – Bushfire retardants. Used to form a chemical firebreak on vegetation ahead of the fire front.

Section 2 – Bushfire suppressants – Used in direct attack to extinguish the fire or to slow its progress.

Section 3 – Firefighting foam (Class A) – Used in direct attack to extinguish or slow the fire, penetrate burning fuel and to wet down areas to prevent re-ignition.

Where it is practicable, the landowner or manager of potentially affected land parcels should be consulted on the proposed use of firefighting agents to establish what sensitivities may be present and what mitigation measures may be needed.

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1 BUSHFIRE RETARDANTS

Fire retardants are chemicals laid down on vegetation ahead of the fire front principally to act as a firebreak against the advancing fire front by inhibiting ignition and combustion. There are a number of different types and compositions of fire retardants available for use on bushfires.

The burning of solid fuels in flaming combustion primarily involves a three-stage process of:

- heating the fuel to initiate breaking of chemical bonds in the fuel
- thermal degradation (pyrolysis) to produce volatile gases
- ignition of the volatile gases with oxygen (vapour-phase combustion).

Combustion of the fuel continues in a feedback loop if the heat from the burning volatiles is sufficient to generate further volatile gases. Fire retardants for vegetation fires seek to interrupt one or more of these process stages [2, 3] through a combination of:

- Insulating the fuel from heat by reducing the temperature at which surface char is produced.
- Reducing generation of flammable gases by reducing fuel temperature.
- Suppressing ignition of volatile gases by generating water vapour or carbon dioxide.

Common formulations of fire retardants have inorganic ammonium phosphate, ammonium polyphosphates or ammonium sulfate as their main constituents, plus additives to improve the physical properties and behaviour and to enhance the retardant effect. Fire retardants in use in Queensland that function in this way include products by Phos-Chek® and FireLimit® products.

The main environmental concerns for the application of fire suppressants is in relation to direct acute short-term toxic effects (unlikely) and longer term chronic effects such as nutrient enhancement by nitrogen and phosphorous, particularly for enclosed waterways and low nutrient ecosystems. In general, adverse environmental effects are unlikely in normal application but retardant use needs to be considered in terms of the local values and sensitivities.

1.1 AMMONIUM PHOSPHATE RETARDANTS

Phos-Chek® is an ammonium phosphates-based retardant in use in Queensland, the primary components are combinations of:

- Ammonium polyphosphate, di-ammonium monophosphate and mono-ammonium phosphate.

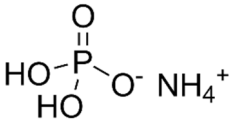
- Organic gum thickeners to enhance integrity of the droplets during aerial free fall.
- Corrosion inhibitors plus conditioners such as clay and inorganic calcium phosphate.
- Colouring agents (red/orange) to provide a visual indication of application [4,5].

Product	Composition		Acute toxicity concentrate (fish)	Acute toxicity diluted (fish)
PHOS-CHEK® MVP-Fx [4]	Mono-ammonium phosphate Di-ammonium phosphate Performance additives	80-90% 5-10% < 15%	2,183 mg/L *Relatively Harmless*	@10% 21,830 mg/L @15% 14,533 mg/L *Relatively Harmless*
PHOS-CHEK® LC95A PHOS-CHEK® LC95A-MV [6]	Ammonium polyphosphate Performance additives Attapulgus clay & iron oxide	60-80% 5-10% 0.5-1.5%	435 mg/L *Practically Nontoxic*	@10% 4,350 mg/L @15% 2,900 mg/L *Relatively Harmless*
PHOS-CHEK® LC95W [7]	Ammonium polyphosphate Performance additives Attapulgus clay	80-100% 5-10% 1-5%	465 mg/L *Practically Nontoxic*	@10% 4,650 mg/L @15% 3,100 mg/L *Relatively Harmless*
PHOS-CHEK® LC95A-Fx [8]	Ammonium polyphosphate Performance additives Attapulgus clay	>85% <8% <5%	399 mg/L *Practically Nontoxic*	@10% 3,990 mg/L @15% 2,660 mg/L *Relatively Harmless*

Note that the published Safety Data Sheet for Phos-Chek® MVP-Fx issued for Australia (15 May 2017) is inadequate, does not meet Queensland's SDS information requirements and cannot be relied upon as it provides little or no information in regards to composition of the product or environmental and disposal considerations. Instead, the US SDS has been used for the composition of Phos-Chek® MVP-Fx and other Phos-Chek® products. The main consideration from an environmental perspective between the different formulations of ammonium phosphate retardants are the degradation rates and ammonium content in that:

- Ammonium polyphosphates (APP) tend to degrade slowly to release nitrogen and phosphorous compounds that are environmentally available.
- Di-ammonium phosphate (DAP) and mono-ammonium phosphate (MAP) are forms that are readily soluble and therefore readily environmentally available.
- Di-ammonium monophosphate has twice the ammonium/nitrogen content of polyphosphates and mono-ammonium phosphate relative to the phosphate content.
- Di-ammonium phosphate and mono-ammonium phosphate (where they are the main component) are potentially of concern for aquatic environments via the high solubility and immediate availability of the toxic ammonium ion in the case of large spills.

Use of Phos-Chek® products with lower DAP and MAP content are preferable near waterways to minimise the risk of adverse effects from misapplication. If a particular formulation of any brand with a high content of DAP or MAP is to be used then the additional ammonium content may need to be considered in terms of potential acute toxicity for waterways. The relationship of the ammonium to phosphate in the three forms is illustrated below.



Mono-ammonium phosphate. Note the single NH_4^+ ammonium ions per phosphate.

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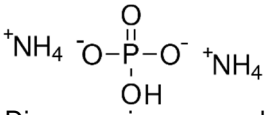
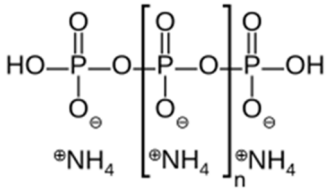
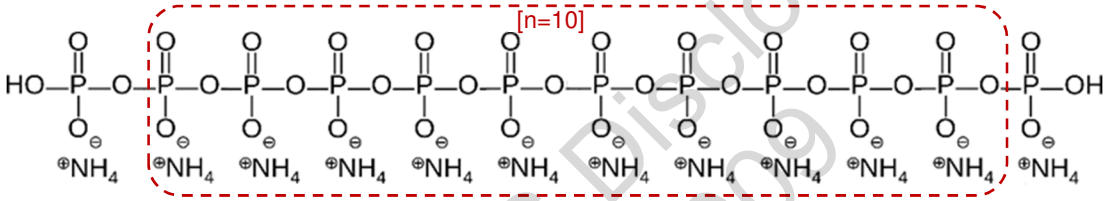


Di-ammonium monophosphate $(NH_4)_2HPO_4$. Note the 2 x NH_4^+ ammonium ions per phosphate.



Ammonium polyphosphate NH_4HPO_4 $[NH_4\ PO_3]_n$ HPO_3
Note the single ammonium ion (NH_4+) per phosphate group.

The "n" in the bracketed "[...]n" in the polyphosphate formula denotes that there are repeated $[NH_4\ PO_3]$ moieties in the molecule. For example, the "[...]$_{10}$" in NH_4HPO $[NH_4\ PO_3]_{10}$ HPO_3 denotes "10" ammonium phosphate moieties between the $HPO_{4/3}$ groups, attached at each end in the APP molecule shown below:



The overall length of the polyphosphate molecules affect their thermal and environmental stability and water solubility. Given that the mode of application is by 10-15% solution dissolved in water, the polyphosphate molecule lengths in fire retardants is likely to be the more soluble short chains of less than n=100 but nonetheless large molecules. Short-chain polyphosphates start to decompose at about 150℃, which also triggers their decomposition and retardant effect as would occur as the bushfire front approaches [9].

1.1.1 Mode of phosphate fire retardant action in fires

Retardants are applied in solutions diluted in water for application spread over large areas, for Phos-Chek® dilution for application is from 10% to 15% [4]. The water involved in the delivery mode evaporates as the fire approaches and does not contribute to fire retardation. Thickeners in the retardant aid water droplet free-fall integrity and enable adhesion to the surfaces of the vegetation (fuel). Once the retardant coating is on the vegetation, the fire retardant effect is achieved through the combined action of:

- **Exposure to heat** decomposes the retardant to ammonia and phosphoric acid.
- **Phosphoric acid** acts in combination with the combustible material such as wood cellulose to catalyse the formation of heat-unstable phosphate esters.
- **Phosphate esters** then decompose to produce carbon dioxide to dilute the oxygen in the air plus water vapour that cools the fire.
- **A carbon char layer** is left on the fuel surface insulating it and inhibiting ignition.

Therefore, there are two circumstances to consider in regards to the potential releases to the environment by the use of ammonium phosphate and polyphosphate flame-retardants:

- Retardant combustion products and residues present after involvement in the fire front.
- Retardant left on materials not involved in the fire (vegetation, soils, rocks, etc.).

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1.1.2 Phosphate retardant subject to the fire

Where the retardant has been involved in the fire front, the reactions that occur will result in the degradation of the polyphosphates and release of nitrogen and phosphorous end-point products being mostly as phosphates and some nitrates (given that most of the ammonia produced in early reactions may well have been lost by combustion or volatilisation to air). Some unaltered retardant may also remain; polyphosphates will degrade slowly according to available moisture and exposure to sunlight while mono-phosphates and nitrogen compounds will be immediately available for uptake by plants. Carbonaceous char layers produced by the retardant on the surface of partially burnt vegetation does not pose any environmental threat and will be an insignificant proportion of the other char layers and charcoal from the fire.

1.1.3 Un-combusted retardant polyphosphates

Short-chain polyphosphates (n<100) are non-volatile and relatively stable. In contact with water, they will hydrolyse to mono-ammonium phosphate (orthophosphate) which is unstable and will further react to form other phosphates thereby making the phosphorous environmentally available for uptake by plants as a nutrient. Photolysis by exposure to sunlight is likely to cause similar degradation. Any ammonium component (NH_4^+) not consumed in the fire will be oxidised to nitrite (NO_2^-) and then to nitrate (NO_3^-) by *nitrosomonas* and *nitrobacter* microbes, reducing the toxicity and ultimately making the nitrogen available as a nutrient to plants.

Un-combusted retardant on an area is likely to degrade slowly through exposure to moisture and sunlight, until there is sufficient rainfall to promote degradation by hydrolysis and wash the resulting nitrogen and phosphorous products into the soil where they can be taken up by plants.

1.1.4 Phosphate retardant fate and effects in the environment

Releases of the ammonium phosphate compounds and their combustion products to the environment can have several effects if in sufficient concentrations including:

- **As sources of nitrogen and phosphorous** (N & P) that promotes local plant growth on land.
- **Promotion of algal blooms** in waterways from N and P nutrient effects leading to eutrophication and dissolved oxygen depletion.
- **Acute (short-term)** toxicity for aquatic fish and invertebrates from the ammonium component, but only at elevated concentrations (~>1.8 mg/L NH_4) such as from a spill of concentrate.

Whether the retardant is involved in the fire or remains as un-combusted residue on the vegetation and soils, the eventual fate for the nitrogen and phosphorous content is their release to the environment. The difference between the scenarios of burnt *versus* unburnt retardant is mainly in the timing and rate of release of nitrogen and phosphorous in biologically available forms against consideration of the assimilative capacity of the local vegetation in an affected area to take up and use the nitrogen and phosphorous for plant growth. In a vegetation fire phosphorous is naturally released to the soil and nitrogen is volatilised so negative impacts are from the small amount of phosphorous contributed by the retardant are likely to be negligible.

Acute toxicity in aquatic environments from normal retardant use is highly unlikely given that acute toxicity for fish (Rainbow trout LC50) for polyphosphate retardant concentrates range from 399 mg/L to 2,183 mg/L [4,8].

Across the available formulations when dilution for application at 10-15% is factored in, the acute toxicity would require concentrations as high as 2,660 mg/L to 21,830 mg/L, which classes as *Relatively Harmless* [10] this is even before further large-scale dilution occurs if the already dilute retardant then enters a waterway.

Given that the application of retardant will be dispersed over areas of existing vegetation growth because that has a fuel load that will carry a fire, then there is likely to be sufficient potential for later uptake by

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plants that will assimilate the nutrients, thereby limiting movement to waterways. To a small extent, the nitrogen and phosphorous nutrients may promote local vegetation regrowth after the fire.

1.2 AMMONIUM SULFATE RETARDANTS

FireLimit® FL-02 (also branded as LineLimit® LL-02) is an ammonium sulfate-based retardant that may be use in Queensland, the primary components are:

- Ammonium sulfate $(NH_4)_2SO_4$ (>60%).
- Organic gum thickeners, (<5%) to enhance integrity of the droplets during aerial free fall.
- Performance additives (inorganic, >35%).
- Colouring agents (red/orange) to provide a visual indication of application [11, 12].

The manufacturer has advised that iron oxide (non-degradable) colourant use was discontinued from 2014 and that only 100% biodegradable food-grade colourants are now used.

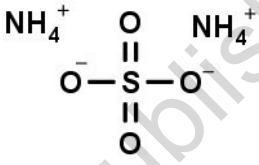
FireLimit® FL-02 retardant [12]

Organism	Concentrate acute toxicity mg/L	US Fish and wildlife toxicity category for concentrate	Suppressant dilute solutions mg/L	US Fish and wildlife toxicity category for dilute suppressant [8]
Fish LC50 96 hour Zebrafish (*Bracbydanio rerio*)	6,930	>1,000 mg/L *Relatively Harmless*	@10% 69,300	>1,000 mg/L *Relatively Harmless*
Crustaceans EC50 48 hour (*Daphnia magna*)	>10,000	>1,000 mg/L *Relatively Harmless*	@10% >100,000	>1,000 mg/L *Relatively Harmless*

The main consideration from an environmental perspective for the FireLimit® FL-02 retardant is the ammonium content in that:

- Ammonium sulfate is readily soluble making the ammonia mobile and environmentally available.
- Ammonium sulfate has two ammonium ions for each sulfate group, i.e., $(NH_4)_2SO_4$.
- Ammonium sulfate is potentially of concern for aquatic environments via the high solubility and immediate availability of the toxic ammonium ion in the case of large spills.

The relationship of the ammonium ions to the sulfate group is illustrated below.



Di-ammonium sulfate. Note the two NH_4^+ ammonium ions per sulfate.

Given that the mode of application FL-02 is as 10% concentrate dissolved in water with a 65% ammonium sulfate concentrate content, the final concentration of ammonium sulfate in the application solution is relatively low at about 6.5% with the ammonium content being about 1.8% by weight. The inorganic performance additives would add a small additional source of nitrogen.

1.2.1 Mode of ammonium sulfate fire retardant action in fires

Retardants are applied in solutions diluted in water for application spread over large areas, for FireLimit® FL-02 the dilution for application is 10% [11]. As for other retardants, the water involved in the delivery mode evaporates as the fire approaches and does not contribute to fire retardation. Thickeners in the retardant aid water droplet free-fall integrity and enable adhesion to the surfaces of the vegetation (fuel).

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Once the retardant coating is on the vegetation, the fire retardant effect is achieved through the combined action of:

- **Exposure to heat** initiates reactions between the retardant and cellulose in the vegetation.
- **Dehydration reactions** reduce the production of combustible volatiles from the woodhen decompose to produce carbon dioxide to dilute the oxygen in the air plus water vapour.
- **A carbon char layer** is generated the fuel surface at a lower temperature than usual insulating it and inhibiting ignition.

Therefore, there are two circumstances to consider in regards to the potential releases to the environment by the use of ammonium sulfate flame-retardants:

- **Retardant combustion products** and residues present after involvement in the fire front.
- **Retardant left on materials** not involved in the fire (vegetation, soils, rocks, etc.).

1.2.2 Ammonium sulfate retardant subject to the fire

Where the retardant has been involved in the fire front, the reactions that occur will result in the degradation of the ammonium sulfate, primarily by the liberation and combustion of the ammonia. The residual sulfate is not likely to have any effect on environmental values, as sulfate is relatively common and benign in the environment. Any small amount of residual ammonia or related compounds would be taken up by plants or utilised by soil microbes. The inorganic performance additive content would contribute some additional nitrogen that would also be taken up by plants.

Carbonaceous char layers produced by the retardant on the surface of partially burnt vegetation would not include significant concentration of ammonium sulfate (if any) and char does not pose any environmental threat and will be an insignificant proportion of the other char layers and charcoal from the fire.

1.2.3 Un-combusted ammonium sulfate retardant

Residual ammonium sulfate from FireLimit® FL-02 on vegetation not involved in the fire is unlikely to cause adverse environmental effects. The most sensitive environmental receptors are enclosed waterways, low nutrient soils and their associated plant species. The dilute form of the retardant and its low rate of application over broad areas make adverse effects on low-nutrient soils and plants highly unlikely. However, retardant application may need to be considered for particularly sensitive locations on a case-by-case and net-benefit analysis basis.

For example, an area with sufficient fuel load to carry a fire may be an indication that there is sufficient vegetation present with the assimilative capacity to take up a small extra load of nutrients from retardants. The alternative of allowing the vegetation and fallen litter to burn may have an adverse effect by the immediate release of nutrients from burning, interrupting the normal, much slower, vegetation-to-soil nutrient cycling process.

Retardant application to riparian areas and waterways is undesirable due to the small risk from acute toxicity, BOD and nutrient effects. However, acute toxicity in aquatic environments from normal ammonium sulfate retardant use is highly unlikely, given that acute toxicity for fish and crustaceans for FireLimit® FL-02 retardant concentrate is 6,390 mg/L and >10,000 mg/L respectively. This falls in the acute aquatic toxicity category of *Relatively Harmless* (>1,000 mg/L) [11, 10] for both the concentrate and for the 10% application solution. This is even before further large-scale dilution occurs if small amounts of the already dilute and dispersed retardant then enter the water body.

The composition of FireLimit® FL-02 is almost entirely soluble inorganic chemicals with very low organic content and therefore very low biochemical oxygen demand (BOD) potential so it does not pose a risk of oxygen depletion in waterways.

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Any ammonium component (NH_4^+) and other nitrogenous compounds from any retardant not consumed in the fire will be volatilised or eventually oxidise to nitrite (NO_2^-) and then to nitrate (NO_3^-) by *Nitrosomonas* and *Nitrobacter* microbes in the soils and water, progressively reducing the toxicity and ultimately making the nitrogen available as a minor source of nutrient to plants.

The ammonia content of un-combusted retardant on an area is likely to degrade slowly through exposure to moisture and sunlight until there is sufficient rainfall to promote degradation by microbial action and hydrolysis, the resulting nitrogen and sulfate products into the soil where they can be taken up by plants.

1.2.4 Ammonium sulfate retardant fate and effects in the environment

Releases of the ammonium sulfate to the environment can have several effects if in sufficient concentrations including:

- **As a source of nitrogen** that promotes local plant growth on land.
- **Promotion of algal blooms** in waterways from the nutrient effect of nitrogen leading to eutrophication and dissolved oxygen depletion.
- **Acute (short-term)** toxicity for aquatic fish and invertebrates from the ammonium component, but only at elevated concentrations (~>1.8 mg/L NH_4) such as from a spill of concentrate that reaches a waterway.

Whether the retardant is involved in the fire or remains as un-combusted residue on the vegetation and soils, the eventual fate for the nitrogen and sulfate content is their release to the environment. The difference between the scenarios of burnt *versus* unburnt retardant is mainly in the timing and rate of release of nitrogen and sulfate in biologically available forms against consideration of the assimilative capacity of the local vegetation in an affected area to take up and use the nitrogen for plant growth.

1.3 OVERALL CONSIDERATIONS FOR FIRE RETARDANT USE

Fire retardants are applied as a dilute solution (10%-15%) resulting in a very thin coating on vegetation, soils and other surfaces spread over a large area. Residues and combustion products will be limited in concentration with the immediate and progressive slow release of end-point nutrients generally unlikely to result in noticeable effects on plant growth or waterway health or other values.

Where the retardant is applied to existing vegetation because there is a fuel load that will carry a fire, then there is likely to be sufficient potential for later uptake by plants that will assimilate the nutrients, thereby limiting movement to waterways. To a small extent, the nitrogen nutrients resulting from the phosphorous and ammonia content (nitrite and nitrate) may promote local vegetation regrowth after the fire.

Where there are particular values present in an area the pros-and-cons of retardant use, mitigation measures or avoidance areas will need to be considered on an individual basis in the context of the particular threats posed by the fire and/or retardant use including:

- **Sensitive, rare or threatened** flora, fauna, or habitats are present.
- **Proximity of sensitive waterways** (e.g., dry-season refuge pools for aquatic species).
- **Cultural resources**, historic properties or sacred sites.
- **Very large volumes of retardant** is spilled or applied in one location that could impact the adjacent values.

It is assumed that fire retardant would only be used when the fire front is about to overtake an area with the result of full involvement and possible severe damage to or loss of infrastructure, environmental or other values. On that basis, a net impact-versus-benefit analysis would be heavily in favour of retardant use given the fire protection benefits versus the much lower risk of related adverse and probably temporary effects.

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Subject to proper handling and management of concentrates and proper response to large spills, ammonium phosphate, polyphosphate and sulfate fire retardants would be suitable for use on QPWS estate.

The general composition of the Phos-Chek® MVP-FX and Phos-Chek® LC95 fire retardants for use in Queensland have been reviewed based on the manufacturer's composition data. Retardants of similar composition would also be suitable. A range of Phos-Chek LC95 product variants were reviewed, while they are all based on ammonium phosphates some, such as Phos-Chek LC95A and LC95A-MV contain iron oxide colourant that could result in long-term rust staining of vegetation, rocks and facilities. The composition of the FireLimit® FL-02 retardant has been reviewed based on published public data and information supplied by the manufacturer.

1.3.1 Flora and fauna

In some circumstances there may be a low risk of temporary acute effects on sensitive flora or fauna from intense retardant use such as:

- **Photosynthesis inhibition** from colouring agents on leaves, especially non-degradable iron oxide pigments that may permanently stain leaf surfaces.
- **Leaf scalding on sensitive species** from the retardant components, degradation products or use of non-potable water such as seawater (e.g., ferns and orchids).
- **Tainting of resources** such as food items consumed by wildlife.

Given the likely conditions during a fire would be extended hot, dry weather, retardant is unlikely to be taken up significantly by the foliage of plants, as the stomata on their leaves are likely to be closed to prevent water loss. Similarly, the long molecular chains of the polyphosphates are likely to be too big to be adsorbed through the leaf surfaces. The use of saline water from brackish or seawater sources for firefighting are unlikely to have significant adverse effects, as application will be spread over a wide area as only a minor contribution to natural soil salts levels.

As a precaution against long-term staining of long-lived or sensitive foliage that may inhibit photosynthesis, for example, cycads (*Cycas* spp.) and grass trees (*Xanthorrea* spp.), and to prevent aesthetic visual staining of vegetation or infrastructure, especially on Parks estate, it should be specified that:

- **Retardants containing iron oxide colourants are not to be used** as they may cause long-term staining.
- **Only retardants with fugitive (biodegradable) colourants are to be used**.

For example, a retardant that is described as containing a fugitive colourant, that will slowly fade during exposure to sunlight would be suitable and not result in significant effects.

1.3.2 Sensitive waterways

Generally, polyphosphate fire retardants are unlikely to have any significant short or long-term effects on waterways in normal use. Retardants based on di- and mono-ammonium phosphates and ammonium sulfates would be of slightly higher risk due to their immediate solubility with the immediate availability of the ammonium component. The main environmental risk would be from spillage or dumping of large volumes of concentrate where it may then travel to a waterway.

Enclosed waterways with limited volumes and turnover are sensitive to acute effects of ammonia toxicity and nutrient enrichment by nitrogen and phosphorous. Where practicable it is desirable to have a buffer (50m to 100m) between the waterway and the application of retardants not only to limit the direct effects of the retardants but also to protect the corridor of riparian vegetation along the waterway for wildlife.

However, in some circumstances, it may be necessary to apply retardants directly to riparian vegetation along a waterway, such as when it is particularly high-value, under direct threat and likely to be lost. Preserving riparian vegetation may also be a priority to maintain ground cover prevent erosion. A net

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benefit analysis may show it is better to protect that environmental value and integrity of the habitat from fire versus potential short-term low-level nutrient enhancement. For example, the threat of fire spot-overs that may jump a chemical or physical firebreak into very high-value vine-forest with very long recovery times (decades).

2 FIRE SUPPRESSANTS

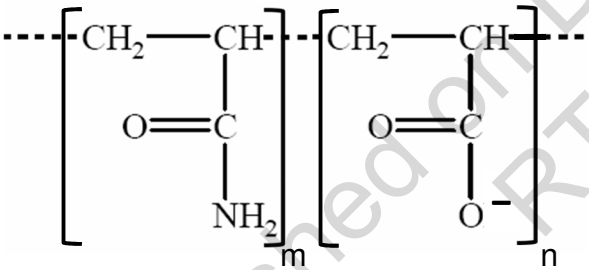
Bushfire suppressants are usually water enhancing gels comprised of super absorbent polymers that can absorb and retain aqueous solutions many times their own weight. They are applied by aerial drops or ground appliances to the fire front as dilute solutions over large areas to suppress and extinguish the fire [13]. The polymers in fire suppressants add to the firefighting effect of the water by:

- **Enhancing the cohesion of the water** droplets during freefall and reducing drift off target.
- **Reduce evaporation of water** as the suppressant enters the heat zone of the fire.
- **Adhesion to vegetation** to cool the fire by evaporation and breaking polymer-to-water bonds.

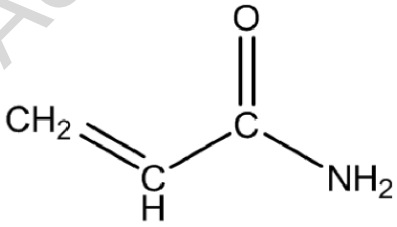
The fire suppressant BlazeTamer380, available for use for bushfires in Queensland, is a water enhancer but differs from other suppressants in that it uses a modified linear polymer emulsion to enhance application behaviour and fire suppression characteristics. The primary components of BlazeTamer380 are:

- Anionic polyacrylamide and surfactants (unspecified content).
- *"Distillates (petroleum), hydrotreated light"* up to 20% [14].

The anionic polyacrylamide in BlazeTamer380® has a very high molecular weight (i.e., large molecules), low mobility in soil, low acute toxicity and is resistant to microbial biodegradation but it will degrade to smaller polymer segments (oligomers) subject to photolysis (sunlight UV exposure) [16]. Degradation to smaller components significantly increases the polymer mobility and raises the concern that the polyacrylamide may produce acrylamide (the single monomer) that is a known toxin and carcinogen [16].



Anionic polyacrylamide unit with "m" denoting the number of acrylamides and "n" denoting the number of anionic (negatively charged$^-$) acrylates repeated in the chain.



Acrylamide monomer. A potential breakdown product of high molecular weight polyacrylamides.

Similar polyacrylamides have long been used in drinking water treatment for flocculation, agricultural soil conditioning, geotechnical soil stabilization and as a viscosity enhancer in the oil industry. In these applications, the polyacrylamide remains largely intact, as it is resistant to degradation under normal conditions.

2.1 Mode of fire suppressant action in fires (BlazeTamer380®)

For BlazeTamer380® the concentrate is used at a rate of less than 1% (0.2% to 0.65%) [15]. The anionic polyacrylamide elastomer used in BlazeTamer380® increases the cohesion and viscosity of the firefighting water so that aerial drops used for direct attack disperse less, evaporate less and adhere to vegetation on contact. As well as direct fire attack, BlazeTamer380® can be used as a retardant in front of the fire. The elastomer binds strongly with the water acting to provide:

- **Cohesion and less drift** of the water droplets during freefall.

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- **Cooling the fire** as heat energy is used to break the elastomer–water bonds.
- **Adhesion to vegetation** that is or may be fuel in the fire.
- **Penetration further into the canopy** on heating as the suppressant on upper vegetation become less viscous and drips down.

2.2 Suppressant subject to the fire

With normal application of suppressants directly to the fire front, some suppressant will be completely degraded to carbon dioxide, water and nitrogen oxides in the fire with no significant potential to cause environmental harm. Assuming the suppressant is effective on the fire front as a suppressant or firebreak, a proportion will remain un-degraded or only partially degraded from the original composition.

Considerations for BlazeTamer380® involved in the fire include:

- **Complete combustion in the fire** is unlikely to produce hazardous breakdown products but residues are likely in unburnt and partially burnt areas such as when used for firebreaks.
- **Hydrocarbon distillates** component of BlazeTamer380® in the fire will mostly be combusted or volatilised. Residues of kerosene-based distillates, where they are not involved in the fire, are likely to occur only at very low levels from the dilute suppressant solution and widely dispersed from application. Any remaining hydrocarbons will volatilise or biodegrade under environmental conditions.

Polyacrylamide residues after involvement in the fire are likely to be minor instances of nitrogen compounds such as nitrate and traces of sooty carbonaceous material from partial combustion.

2.3 Un-combusted suppressant

Where the polyacrylamide suppressant is not involved in the fire or a proportion remains un-degraded or only partially degraded from the original composition the overall, key considerations BlazeTamer380® use include:

- **Acute (short-term) toxicities** for aquatic fish, invertebrates, algae and bacteria are very low for the BlazeTamer380® product [14] either as concentrate or as dilute suppressant.
- **Hydrocarbon distillates** residues of BlazeTamer380® kerosene-based distillates not involved in the fire, are likely to rapidly volatilise or biodegrade under environmental conditions.
- **Unaltered anionic polyacrylamide** residue in soils is largely inert, has low mobility and low toxicity and is unlikely to have any direct adverse effects.
- **Nitrogen from the amide component (-NH_2)** of intact polyacrylamide will be released slowly and only contribute a small proportion of nitrogen (as a plant nutrient) in breakdown products.

Acute toxicity LC50 and EC50 values for aquatic environments are cited for the product as sold [14] and summarised in the table below.

BlazeTamer380® suppressant [14]

Organism	Concentrate acute toxicity mg/L	US Fish and wildlife toxicity category for concentrate	Suppressant dilute solutions mg/L	US Fish and wildlife toxicity category for dilute suppressant [10]
Fish LC50 96 hour Zebrafish (*Bracbydanio rerio*)	178 - 357	100-1,000 mg/L *Practically Nontoxic*	@0.2% - 89,000-178,500 @0.65% - 27,385-54,923	>1,000 mg/L *Relatively Harmless*
Crustaceans EC50 48 hour (*Daphnia magna*)	212	100-1,000 mg/L *Practically Nontoxic*	@0.2% - 106,000 @0.65% - 32,615	>1,000 mg/L *Relatively Harmless*
Algae EC50 48 hour (Chlorella vulgaris)	>1,000 (NOEC 708)	>1,000 mg/L *Relatively Harmless*	@0.2% - 500,000 @0.65% - 153,846	>1,000 mg/L*Relatively Harmless*

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BlazeTamer380® suppressant [14]				
Organism	**Concentrate acute toxicity mg/L**	**US Fish and wildlife toxicity category for concentrate**	**Suppressant dilute solutions mg/L**	**US Fish and wildlife toxicity category for dilute suppressant** [10]
Bacteria EC10/EC50 18 hour (Pseudomonas putida)	EC10 127 EC50 892	100-1,000 mg/L *Practically Nontoxic*	@0.2% - 63,500-19,583 @0.65% - 446,000-137,231	>1,000 mg/L *Relatively Harmless*

Toxic acrylamide monomer may be released slowly as a minor component during breakdown of the polyacrylamide but this is likely to be transient and degraded microbially to traces of acrylic acid, ammonia and nitrates that can be taken up by plants.

2.4 Fire suppressant fate and effects in the environment

Water enhancing and gel fire suppressants based on super absorbent polymers need to be considered in terms of composition and application rates. While the polymers and surfactants used in fire suppressants will ultimately be degradable, their persistence in the environment and potential for adverse effects depends on their formulations.

In the case of BlazeTamer380® used in Queensland, the composition includes anionic polyacrylamide, surfactants and solvent hydrocarbons. Acute toxicity effects for BlazeTamer380® probably relate mostly to the hydrocarbon solvent content (up to 20%) or other surfactants and enhancers and not to the polyacrylamide. In normal application, it is highly unlikely that there would be acute toxicity effects for waterways or soils.

The carrier solvent for the polyacrylamide in BlazeTamer380® is "*Distillates (petroleum), hydrotreated light*", this is effectively a form of deodorised kerosene (similar to white spirit) composed of a mixture of alkane and alkene hydrocarbons with chain lengths from C8 to C19 [14]. These hydrocarbons are probably the primary influence on acute (short-term) environmental effects; the mixed hydrocarbon chain lengths will influence the extent of acute toxicity, volatility, persistence and biodegradation.

Shorter-chain hydrocarbons are more toxic but also more volatile and less persistent while the longer-chains are less volatile and more persistent but less toxic. Other suppressants may use similar hydrocarbon carriers. REACH registrations identify that these distillates are *toxic to aquatic life with long lasting effects* (Aquatic Chronic 2) [17]. However, at a proportion in the concentrate of 20% or less in BlazeTamer380®, with further dilution for application to 0.2% to 0.65%, the solvent would only be a minor component of 0.04% to 0.13% of the suppressant applied to the fire.

There is little known about the potential for generation of toxic acrylamide monomers from breakdown of polyacrylamide due to partial combustion or environmental degradation. Given the high dilution of the original polyacrylamide in the applied suppressant, wide dispersal in application and slow breakdown, significant effects are unlikely. If acrylamide monomers are generated, that will occur slowly limiting the immediate toxicity load, the monomer should then biodegrade relatively quickly (~5 days in soils, ~14 days in waterways [16]).

However, in line with the *Precautionary Principle* [18] and the recommendation in the SDS to prevent releases to waterways, it is desirable that application and spills of polyacrylamide suppressants avoid releases to waterways, or drains that lead to waterways. The other characteristics of BlazeTamer380® should not present a threat to rare and threatened species, amenity and condition of infrastructure or historic and cultural heritage places.

3 FIREFIGHTING FOAMS (Class A)

Firefighting foams are used across a range of fires broadly divided into two classes:

- **Class A** – Carbonaceous materials fires (e.g., vegetation, wood, coal, tyres, etc.).
- **Class B** – Liquid fuel fires (e.g., oil, petrol, diesel, ethanol, etc.).

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The principle difference between the action of each foam type is the mode of cooling and extinguishing of the fire:

- **Class A** foams are designed to penetrate into and wet the burning material to cool, extinguish, exclude oxygen and prevent re-ignition (e.g., vegetation, paper, tyres, etc.).
- **Class B** foams are designed to form a blanket and float on top of the liquid hydrocarbon fuel to suppress the vapour, cool the fuel and exclude oxygen.

Only Class A rated firefighting foams that act to penetrate and wet the burning material are used on vegetation fires. Some foams are rated for use on both Class A and Class B fires.

- **NOTE - AFFF, FFFP, FP or their –AR variants** must NEVER be used for bushfire or non-licensed firefighting under any circumstances (e.g., 3M Light Water, Ansulite, Tridol, etc.).

These foams contain toxic PFAS, fluorinated organic permanent pollutants, which have caused widespread global contamination impacting wildlife, human health and resource values.

Queensland has banned the use of PFAS foams except for a few very limited and regulated uses where they cannot be released to the environment [18]. PFAS foams may be encountered at industrial or remote locations where there are leftover drums of legacy AFFF/FFFP/FP foams that may be offered or "donated" for use.

If PFAS foams are encountered, they must be quarantined and the occurrence reported to the regional compliance team. All foams for use on bushfires must be non-persistent "fluorine-free" foam. If there is any doubt, seek advice from the Incident Response Unit or the local SIRN (State Incident Response Network) officer via the Pollution Hotline 1300 130 372.

3.1 Mode of firefighting foam action in fires

Class A firefighting foams can be applied by aerial drops or ground appliances to the fire front as dilute solutions (~0.5% to 1%) to suppress and extinguish the fire. Class A firefighting foams increase the effectiveness of water by:

- **Acting as wetting agents** to penetrate into, cool and extinguish burning materials
- **Absorbing heat** reducing the amount of water needed to extinguish a fire.
- **Penetrating and wetting** vegetation to prevent ignition in "wet fire breaks".
- **Reducing water evaporation** and maintain wetting of dampened down areas.

3.2 Firefighting foam fate and effects in the environment

Several Class A foams are available for use in Queensland. Solberg foams are in common use by QFES urban and rural fire brigades, all are fluorine-free and fully biodegradable including Solberg Fire-Brake™ 3150A, a Class A foam for bushfire firefighting.

The primary components of Class A firefighting foams are:

- Surfactants (organic biodegradable detergents).
- Solvents (organic biodegradable glycol ethers)
- Saccharides, emulsifiers, thickeners, stabilizers and preservatives.

Class A firefighting foams are generally applied at low concentrations of ~0.5% to 1 % from the air or by ground appliances. Acute environmental toxicity values for Fire Brake 3150A are very low for the dilute application solutions [19].

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Solberg Fire-Brake™ 3150A Class A foam				
Organism	**Concentrate acute toxicity mg/L**	**US Fish and wildlife toxicity category for concentrate**	**Fire Brake Class A foam dilute solutions mg/L**	**US Fish and wildlife toxicity category for dilute foam** [8]
Fish LC50 96 hour Rainbow trout (*Oncorhynchus mykiss*)	22	10-100 mg/L *Slightly Toxic*	@0.5% – 4,400 @1% – 2,200	>1,000 mg/L *Relatively Harmless*
Crustaceans EC50 48 hour (*Daphnia magna*)	72	10-100 mg/L *Slightly Toxic*	@0.5% - 14,400 @1% - 28,800	>1,000 mg/L *Relatively Harmless*

Fire-Brake™ 3150A is non-bioaccumulative and readily biodegradable in waterways to about 86% in 28 days and to 99% in about 45 days. Overall, it classes as relatively harmless to aquatic species and is unlikely to have any adverse effects.

Class B Solberg RF6™ and Solberg RF3x6™ ATC (RF re-healing foams) can also be used on Class A fires. Solberg Class B/A foams are usually used on Class B hydrocarbon fuel spills and fires, they can also be used on vegetation fires to penetrate and wet fuels. Urban appliances are likely to carry RF6™ or RF3x6™ ATC Class B/A foams.

Solberg RF6™ is usually applied at 6% but may be applied further diluted to a lower percentage for vegetation fires. Acute toxicity for Solberg RF6™ is summarised below [20]. RF6 is non-bioaccumulative and readily biodegradable in waterways to about 87% in 28 days and to 99% in about 45 days, overall, it classes as practically non-toxic to aquatic species.

Solberg RF6™ Class B/A foam				
Organism	**Concentrate acute toxicity mg/L**	**US Fish and wildlife toxicity category for concentrate**	**Solberg RF6 Class B/A foam dilute solutions mg/L**	**US Fish and wildlife toxicity category for dilute foam** [10]
Fish EC50 96 hour Rainbow trout (*Oncorhynchus mykiss*)	42	10-100 mg/L *Slightly Toxic*	@6% – 700	100-1,000 mg/L *Practically Nontoxic*
Crustaceans EC50 48 hour (*Daphnia magna*)	644	10-100 mg/L *Slightly Toxic*	@6% – 11,067	>1,000 mg/L *Relatively Harmless*
Algae EC50 96 hour (*Selenastrum capricornutum*)	>6.9	1-10 mg/L *Moderately Toxic*	@6% – >115	100-1,000 mg/L *Practically Nontoxic*

Some rural ground appliances have adopted a Class A wetting agent in-line mixing system based on a solid block of surfactant that dissolves into the flow of branch line water for application. For example, the QuickCorp *Solid EF* units of this type are in use on some rural and QPWS ground appliances in Queensland [21,22]. The surfactant is dissolved in a fixed proportion of 0.02% (1kg / 5,000L) into the branch line. The composition of the Solid EF block is similar to liquid Class A foams with a mixture of surfactants, glycol ether solvent and enhancers that are biodegradable.

Test results for the as-sold *Solid EF* product were not available, but given that the composition is relatively simple EC50 and LC50 values and proportions for the two ingredients with the greatest effect on the most sensitive aquatic species, (*Daphnia*/invertebrates) were used to estimate the LC/EC50 at about 3.07 mg/L as per the table below [22]. Given that the product is used in small quantities (200g to 1kg) of a solid material, spills that could enter a waterway are unlikely to occur.

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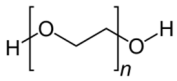
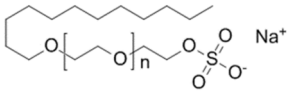
QuickCorp *Solid EF*			
Component	**Polyethylene glycol (MW 4000)**	**Sodium lauryl ether sulphate**	**Cocamide diethanolamide**
Proportion in Solid EF	75%	**20%**	**5%**
Structure	 $H[OC_2H_4]_nOH$	 $CH_3(CH_2)_{11}(OCH_2CH_2)_nOSO_3Na$	$[CH_3(CH_2)]_nC(=O)N(CH_2CH_2OH)_2$
EC50 Daphnia (48 hr)	1000 mg/L	**3.43 mg/L**	**2.15 mg/L**
Fish LC50 (96 hr)	100 mg/L	7.42 mg/L	3.6 mg/L
Most sensitive receptor (*Daphnia*) EC50 = (20+5)/((20/3.43)+(5/2.15)) = **3.07 mg/L**			
Wetting agent in use dilution 1:5000 = **3,065 mg/L (=*Relatively Harmless*)** [10]			

The primary environmental risk from Class A firefighting foams and wetting agents is from large concentrate spills that enter aquatic environments where they may cause dissolved oxygen depletion due to BOD from the decay of the organic components. Where practical, application to waterways with standing water present and to riparian vegetation close to waterways should be avoided.

3.3 Firefighting foam subject to the fire

With normal application of firefighting foam to the fire front and in damping down of embers in burned areas, some foam involved in the main fire will be completely degraded to carbon dioxide and water with no significant potential to cause environmental harm. Assuming the foam is effective on the fire front and in the case of damping down and forming of wet firebreaks, a proportion will remain un-degraded or only partially degraded from the original composition.

Overall, key considerations for Class A non-persistent (fluorine-free) firefighting foams are:

- Combustion in the fire will not produce hazardous breakdown products but residues are likely in unburnt and partially burnt areas such as when used for firebreaks.
- Acute (short-term) toxicities for aquatic fish, invertebrates, algae and bacteria are very low for the Class A foams that are primarily based on biodegradable surfactants and solvents.
- Class A firefighting foam components subject to the fire will mostly be combusted or volatilised.
- Residues and unaltered Class A firefighting foams are readily biodegradable with low toxicity in dilute form.

Residues from Class A firefighting foams applied to soils will act as a wetting agent to allow water (rain) infiltration and the composition breakdown products will be a source of carbon for plant growth. No significant adverse effects from application of Class A foams are likely where the application is not directly to the water body.

4 FURTHER INFORMATION

For further information and advice on these or related products contact the Department of Environment and Science, Incident Response Unit via the 24 hour Pollution Hotline 1300 130 372.

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Roles and Responsibilities

Department of Environment and Science (DES)

DES division of Environmental Services and Regulation (ESR) provides advice on environmental protection issues, clean-up, recovery and waste disposal matters. DES participates within established incident control systems as required, generally under the direction of QPS or QFES. For bushfires involving QPWS estate ESR would provide advice on an as-needs basis to assess and manage the use of firefighting agents.

Queensland Parks & Wildlife Service (QPWS)

QPWS provides incident control and/or combat agency support for bushfires as appropriate in conjunction with QFES. For bushfires involving QPWS estate QPWS would engage with ESR on an as-needs basis to assess the use and management of firefighting agents.

Office of Water Supply Regulator, Water authorities and Users

Where there is the potential for contaminants to adversely affect public drinking water supplies, for both surface and groundwater situations, the Office of Water Supply Regulator and relevant water authorities and users should be contacted.

Qld Police Service (QPS)

Where the *Public Safety Preservation Act* has been declared the responsibilities of the QPS are to provide:

- Control and coordination of the incident (including the on-site and off-site emergency environment).
- Coordination of the efforts of contributory agencies.
- Securing the incident scene from unauthorised entry or departure.
- Crowd and traffic control.

Queensland Fire & Emergency Service (QFES)

QFES has lead responsibility for protection of persons, property and the environment from fire and hazardous materials emergencies. It also provides an advisory service, and other measures to promote safety and protect property if a fire or hazardous materials emergency happens.

Relevant guidelines, policies, codes, regulations and legislation

Environmental Protection Act 1994
Environmental Protection Regulation 2008
DES Operational Policy – *Environmental Management of Firefighting Foam*.

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Approved by:

Personal information - signature/initial

Signature

20/8/2020

Date

Rob Lawrence
Deputy Director-General
Environmental Services and Regulation

Resource References

US Department of Agriculture
Fish and Wildlife acute toxicity scale [8].

	Effective concentration
Toxicity Category	**Range (mg/L)**
Super Toxic	< 0.01
Extremely Toxic	0.01 –0.1
Highly Toxic	0.1 –1
Moderately Toxic	1 –10
Slightly Toxic	10 –100
Practically Nontoxic	100 –1,000
Relatively Harmless	> 1,000

US Fish and Wildlife Service toxicity scale
Aquatic EC50 or LC50 (freshwater)

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[6] Perimeter Solutions (2019) – Safety Data Sheet, PHOS-CHEK® LC95A/PHOS-CHEK® LC95A-MV

[7] Perimeter Solutions (2019) – Safety Data Sheet, PHOS-CHEK® LC95W

[8] Perimeter Solutions (2019) – Safety Data Sheet, PHOS-CHEK® LC95A-Fx

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[17] ECHA (2020) – Chemical Registration CAS 265-149-8 https://echa.europa.eu/registration-dossier/-/registered-dossier/15375/1

[18] Queensland (2016) – *Environmental Management of Firefighting Foam, Operational Policy*. Qld Dept. of Environment and Heritage Protection.

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http://www.solbergfoam.com/getattachment/dd6f1e03-6719-45bf-9032-8a8ff54e0ede/SDS_RF6_Safety_Data_ENG.aspx

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http://www.qcfe.com.au/Products/Accessories-500/Foam-441/SolidEF-479/
http://www.qcfe.com.au/adm/filemanager/userfiles/QUIK_CORP_FIRE/Foam/QUIKCORP%20SOLID%20EF%20SDS_V1_01.06.2018.pdf

[22] QuickCorp / Davoren Environmental 2018 – Report, Hazard assessment of QuickCorp Solid EF.

Other issues to consider

QFES and CASA guidelines for aerial application of firefighting agents.

QFES 2019 - Use of Water Additives in Controlling Bushfires - Information Guide.
https://www.ruralfire.qld.gov.au/BushFire_Safety/Pages/Water-Additives.aspx

Bushfire CRC 2005 - Using chemicals in firefighting operations
https://www.bushfirecrc.com/resources/firenote/using-chemicals-firefighting-operations

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Incident Response
Bushfire firefighting agents
Retardants – Suppressants - Foams

Nigel Holmes
Principal Advisor Incident Management
Incident Response Unit
Department of Environment and Science

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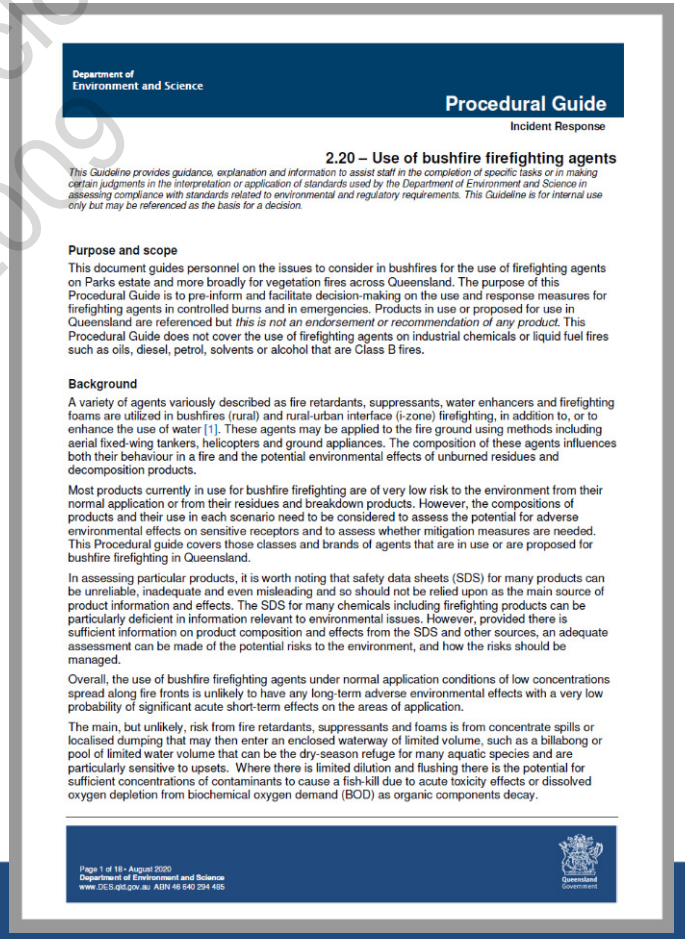
Bushfire agents use

- Types available (Retardants – Suppressants – Foams)
- Environmental risks
- Application considerations
- Stakeholders' values
- Advice on use (PG 2.20)



Department of Environment and Science

Procedural Guide

Incident Response

2.20 – Use of bushfire firefighting agents

This Guideline provides guidance, explanation and information to assist staff in the completion of specific tasks or in making certain judgments in the interpretation or application of standards used by the Department of Environment and Science in assessing compliance with standards related to environmental and regulatory requirements. This Guideline is for internal use only but may be referenced as the basis for a decision.

Purpose and scope

This document guides personnel on the issues to consider in bushfires for the use of firefighting agents on Parks estate and more broadly for vegetation fires across Queensland. The purpose of this Procedural Guide is to pre-inform and facilitate decision-making on the use and response measures for firefighting agents in controlled burns and in emergencies. Products in use or proposed for use in Queensland are referenced but *this is not an endorsement or recommendation of any product.* This Procedural Guide does not cover the use of firefighting agents on industrial chemicals or liquid fuel fires such as oils, diesel, petrol, solvents or alcohol that are Class B fires.

Background

A variety of agents variously described as fire retardants, suppressants, water enhancers and firefighting foams are utilized in bushfires (rural) and rural-urban interface (i-zone) firefighting, in addition to, or to enhance the use of water [1]. These agents may be applied to the fire ground using methods including aerial fixed-wing tankers, helicopters and ground appliances. The composition of these agents influences both their behaviour in a fire and the potential environmental effects of unburned residues and decomposition products.

Most products currently in use for bushfire firefighting are of very low risk to the environment from their normal application or from their residues and breakdown products. However, the compositions of products and their use in each scenario need to be considered to assess the potential for adverse environmental effects on sensitive receptors and to assess whether mitigation measures are needed. This Procedural guide covers those classes and brands of agents that are in use or are proposed for bushfire firefighting in Queensland.

In assessing particular products, it is worth noting that safety data sheets (SDS) for many products can be unreliable, inadequate and even misleading and so should not be relied upon as the main source of product information and effects. The SDS for many chemicals including firefighting products can be particularly deficient in information relevant to environmental issues. However, provided there is sufficient information on product composition and effects from the SDS and other sources, an adequate assessment can be made of the potential risks to the environment, and how the risks should be managed.

Overall, the use of bushfire firefighting agents under normal application conditions of low concentrations spread along fire fronts is unlikely to have any long-term adverse environmental effects with a very low probability of significant acute short-term effects on the areas of application.

The main, but unlikely, risk from fire retardants, suppressants and foams is from concentrate spills or localised dumping that may then enter an enclosed waterway of limited volume, such as a billabong or pool of limited water volume that can be the dry-season refuge for many aquatic species and are particularly sensitive to upsets. Where there is limited dilution and flushing there is the potential for sufficient concentrations of contaminants to cause a fish-kill due to acute toxicity effects or dissolved oxygen depletion from biochemical oxygen demand (BOD) as organic components decay.

Refer to sections on "fate and effects in the environment"

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Bushfire agents types

FIRE RETARDANTS

Chemical firebreak ahead of the fire front

FIRE SUPPRESSANTS

Direct attack to extinguish or slow the fire

FIREFIGHTING FOAM (Class A)

Direct attack to extinguish or slow the fire and for damping down to prevent re-ignition

Composition

All are biodegradable but can have short-term adverse environmental effects, especially in waterways

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Bushfire agents considerations

Include stakeholder values in planning

- Where possible consult stakeholders & map values
- Landholders may have sensitive values (crops/stock)
- Parks estate may have sensitive species/habitats
- Residential areas values (e.g. rainwater collection)
- “Organic produce” rated farms

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Bushfire agents considerations

Normal application

- Avoid intensive use on or close to waterways
- Components will biodegrade in soils
- Vegetation will take up nutrients
- Very low risk to the environment in normal dispersed use for firefighting

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Bushfire agents considerations

Concentrate spills

- Potential for acute toxicity and nutrient enhancement in waterways
- Handle concentrates well away from waterways
- Clean up any spills to prevent entry to waterways

Dilute wastes

- Can be irrigated to open ground to biodegrade

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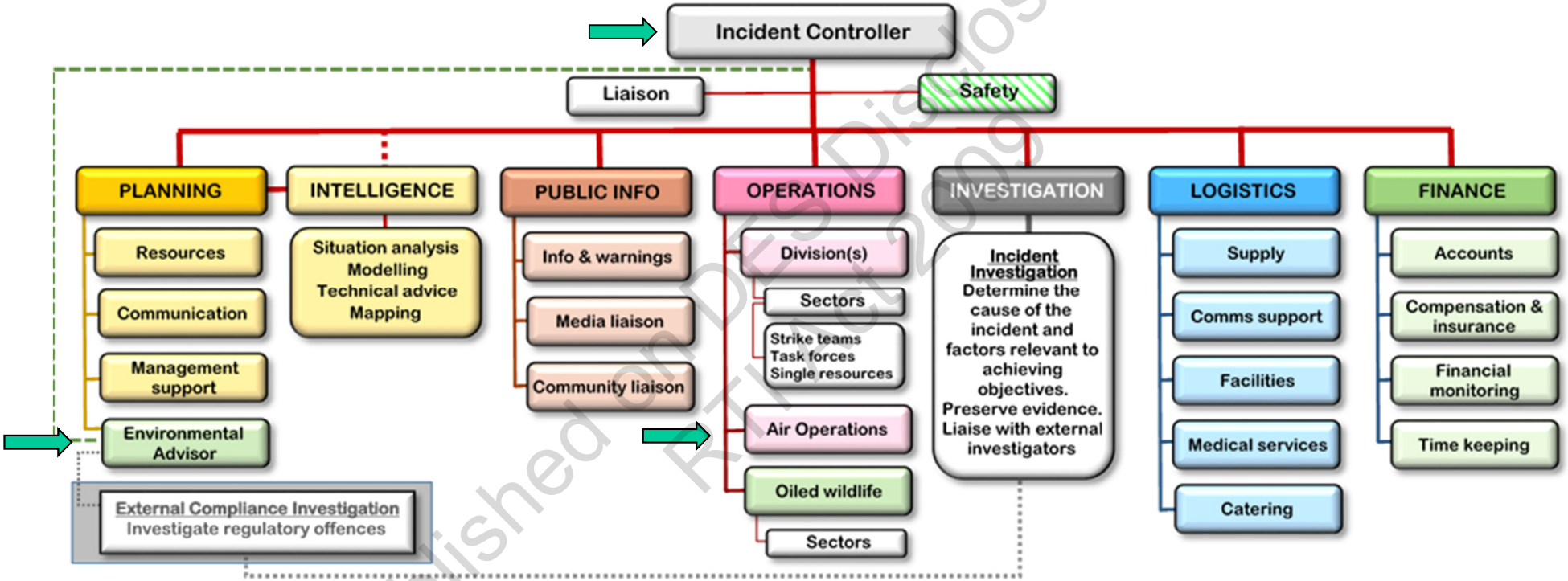
Bushfire agents considerations

Where to get advice



DES role - Environmental Advisor to the Planner or IC.

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Incident Response
Bushfire firefighting agents

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