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Communications Information Channel Location and Comments Good coverage

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RFS and NPWS radios can chat on same fireground RFS FG 1-20 channels NPWS FG 41-60 • NPWS FG channel is numbered 40 highe r than RFS FG channel (e.g. RFS FG 3 = NPWS FG 43) • Available in most NSWFB and RFS vehicles Choose channel on fire -ground with NSWFB and RFS

1 - 99 Good coverage

Operational Guidelines Refer to 2015 Fire Management Manual. Brief all personnel involved in suppression operations on the following issues: Guidelines The use of bombing aircraft should support containment operations by aggressively attacking hotspots and spot-overs. The use of bombing aircraft without the support of ground based suppression crews should be limited to very specific circumstances. Where practicable foam should be used to increase the effectiveness of the water. Ground crews must be alerted to water bombing operations. Aerial ignition may be used during back-burning or fuel reduction operations where practicable, but only with the prior consent of NPWS Regional Manager or Section 44 delegate. Utilise incendiaries to rapidly progress back-burns down slope where reauired. Temperature and humidity trends must be monitored carefully to determine the safest times to implement back-burns. Generally, when the FDI is Very High or greater, backburning should commence when the humidity begins to rise in the late afternoon or early evening. With a lower FDI backburning may be safely undertaken during the day. Where practicable, clear a 1m radius around dead and fibrous barked trees adjacent to containment lines prior to backburning, or wet down these trees as part of the backburn ignition. Avoid ignition of backburns at the bottom of slopes where a long and intense up slope burn is likely. The first combatant agency on site may assume control of the fire, but then must ensure the relevant land management agency is notified promptly. On the arrival of other combatant agencies, the initial incident controller will consult with regard to the ongoing command, control and incident management team requirements as per the relevant BFMC Plan of Operations. Construction of new containment lines should be avoided, where practicable, except where they can be constructed with minimal environmental impact. New containment lines require the prior consent of a senior NPWS officer. Where practicable, containment lines should be stabilised and rehabilitated as part of the wildfire suppression operation. All containment lines not required for other purposes should be closed at the cessation of the incident. All personal involved in containment line construction should be briefed on both natural and cultural heritage sites in the location. Earthmoving equipment may only be used with the prior consent of a senior NPWS officer, and then only if the probability of its success is Earthmoving equipment must be always guided and supervised by an experienced officer, and accompanied by a support vehicle. When engaged in direct or parallel attack this vehicle must be a firefighting vehicle. Containment lines constructed by earthmoving equipment should consider the protection of drainage features, observe the Threatened Species and Cultural Heritage Operational Guidelines, and be surveyed, where possible, to identify unknown cultural heritage sites. Earthmoving equipment should be washed down, where practicable, prior to it entering NPWS estate.
 Fire Advantage
 •
 All fire advantages used during wildfire suppression operations must be mapped and where relevant added to the database.
 Wetting and foaming agents (surfactants) are permitted for use in wildfire suppression. The use of fire retardant is only permitted with the prior consent of the senior NPWS officer, and should be avoided where reasonable alternatives are available. Exclude the use of surfactants and retardants within 50m of rainforest, watercourses, dams and swamps. Areas where fire suppression chemicals are used must be mapped and the used product's name recorded. The Threatened Species Operational Guidelines are to be observed. Where practicable, containment lines should be stabilised and rehabilitated as part of the wildfire suppression operation. The potential impacts of smoke and possible mitigation tactics must be considered when planning for wildfire suppression and prescribed burning operations. (NPWS FMM 4.3.2) • If smoke becomes a hazard on local roads or highways, the police and relevant media must be notified. Smoke management must be in accordance with relevant RTA traffic uppression Strategies As far as possible, undertake indirect, parallel or direct attack along existing control lines. As far as possible, maximise area burnt without threatening assets, including biodiversity. Identify and survey backup control lines Undertake indirect, parallel or direct attack to minimise the time taken to contain the fire. Construct new control lines if necessary to minimise the time to contain the fire. Identify and survey backup control lines. Undertake indirect attack along existing or newly constructed control lines. Secure and deepen control lines along the next predicted downwind side of the fire. Identify and survey backup control lines. Ensure there is sufficient time to secure control lines before

legetation Communities and Biodiversity Threshold Biodiversity Thresholds Behaviour Burnt (Ha) Exclude fire where possible Low to Low to Moderate (depending on 2012 Moderate time since last rain) 2013 imum Fire Interval: 4-6 years laximum Fire Interval: 15–20 years Re-assess biodiversity after approx. 15 years as Bursaria Moderate tends to become competitively to High dominant and Themeda dies 2011 (after approximately 10-12 2012 Significant research & monitoring is required Sandstone Minimum fire interval 8 – 10 years 2013 0.2 Implement variable fire regime within this range Maximum fire interval 15 - 30 years Moderate Longer unburnt areas tend to have increased weed invasion. Moderate 2011 to High 2013 May need to implement fire to assist in weed management Site and context specific, 2011 therefore research and monitoring 2012 reauired 2013 105 Recommend an initial inter-fire 2011 interval of 2-3 years followed by 2013 a longer interval of 5-10 years 2013 7.6 *There is insufficient data to give definite details however, available data indicates approximate ninimum and maximum intervals as those specified above. It is important to note that specifying the

the fire gets to them.

the next potential control line.

If there is insufficient time to secure control lines, fall back to

As far as possible, implement threatened species and

cultural heritage management guidelines.

Suppression end	
ur 20 metres	
Estate	

Hazard Reduction 2009/10 - 2015/16

Scale 1:16,000 300



Resource	Guidelines					
Aboriginal Cultural Heritage						
Site Management						
	As far as possible protect site from fire.					
IS2	 Avoid ground disturbance including handtools, dozers. Avoid water bombing which may cause ground disturbance 					
Avoid water bornoing which may cause ground disturbance. Historic Heritage						
	Site Management					
	As far as possible, protect site from fire					
HS1	 Avoid all ground disturbances, including the use of earthmoving machinery, handline construction and driving over sites 					
nor	 Avoid water bombing 					
	Use of foam, wetting agents and retardant is acceptable Avoid all ground disturbances, including the use of earthmoving					
	machinery, handline construction and driving over sites					
HS4	Water bombing and the use of foams, wetting agents and rotardant are acceptable					
	 Site me be burnt by bushfire, back burn or prescribed burn 					
	without damage					
	(NPWS FMM 2.1 & 4.2)					
EA1	Avoid fires during the breeding season and peak flowering account of the breeding season and peak flowering					
FAI	Avoid fire that consumes the canopy					
FA2	Avoid high intensity fires that consumes the canopy Avoid fires in times of pactar accretion (vinter)					
FAZ	 Avoid mes in times of nectal scarcity (winter) No slashing or trittering or earth-moving equipment 					
	Protect logs and fallen timber and dead standing timber Maintain appropriate fire frequencies to prove t deade					
EAD	Information appropriate fire frequencies to prevent dense understoreys					
FAJ	No slashing or trittering or earth-moving equipment					
	 Avoid fires during the breeding season (August - January) Avoid fire intervals < 3 years 					
	Protect large old, hollow-bearing trees					
	 Exclude fire or protect riparian zone from frequent fire Protect logs and fallen timber 					
FA4	• Avoid high intensity fire that consumes the canopy and frequent					
	 Inters over large areas No slashing or trittering or earth-moving equipment 					
	Avoid smoke and fires during the breeding season					
	(Autumn/winter) Protect large old, hollow-bearing trees					
	 Avoid smoke and fire near known roost/den trees, roost sites and 					
FA5	during the breeding season (spring/summer) Avoid high intensity fire that consumes the canony and frequent					
	fires over large areas					
	Protect logs and fallen timber Protect large_old hollow-bearing trees					
	 Avoid smoke and fire during the breeding season 					
FA6	 (spring/summer) Avoid fire in, or protect the riparian zone from frequent fire 					
1710	Avoid hot fires that consume canopy and high intensity fire over					
	large areas Avoid fire intervals < 6 years					
	Protect logs and fallen timber					
FA11	 Avoid fire in known habitat locations If not possible, avoid fires > 1 ha in known habitat locations 					
	No slashing, trittering or earthmoving works					
	Threatened Flora Management					
	Avoid inter- fire intervals of < 8 - 15 years					
FI A	 Avoid inter-fire intervals > 20 - 30 years No slashing or trittering or earthmoving machinery 					
1 64	Avoid the use of chemical retardant					
	Avoid burning during August to March Avoid inter-fire intervals of < 10 - 12 years					
	 Avoid inter-fire intervals of > 20 - 25 years 					
FL5	 No slashing trittering or tree removal or earth moving equipment Avoid use of retardants 					
	Avoid fire November - March					
	Avoid inter-fire interval of < 10 - 15 years Avoid inter-fire intervals > 20 - 25 years					
EI 7	Moderate-high intensity fires preferable - Late summer/Autumn					
FL/	No slashing, trittering or tree removal or use of earthmoving aquinmont					
	Avoid use of retardant					
	Avoid inter-fire intervals < 10 - 15 years					
	 Avoid inter-fire intervals > 20 - 30 years Avoid high intersity fire 					
FL8	No slashing, trittering or tree removal or use of earthmoving					
	equipment					
	Avoid use of relardant Where possible property owners with assets at risk from a wildfire					
Threatened	event should be kept informed regarding the progress of the fire;					
Property	and asked for an assessment of their current level of asset protection preparedness.					
Threatened Fauna Fire Ecology						

abol	Namo	Eiro Ecology
avel	Chthonios	FILE ELUIUUS
	Cnthonicola	Avoid frequent, high intensity burning within known habitat during breeding season (August -
	Sagittata	January). Avoid any fire management operations within known habitat. The breeding
	Speckled	season is between July and February. Nests are constructed on the ground and are wen
	(Vulperable)	concealed by vegetation, lear litter, and trees of sinubs.
	(vuinerable)	Cuprival and population visbility are constitute to babitat isolation, reduced patch size and
	Daphoenositta	Survival and population viability are sensitive to habitat isolation, reduced patch size and
	chrysoptera	nabilal simplification, including reductions in the species diversity, the catropy cover, simulations are species diversity, the catropy cover, simulations are species diversity and the species diversity and the species diversity are species species di
	Varied Sittella	cover, ground cover, logs, lanen branches and inter. Listed timeats include removal of live
	(Vulnerable)	regimes. Breeding season is August to January
		Neets in provimity to feeding grade if possible, usually selecting bollows of smooth barked
	Glossonsitta	Fucality to leading aleas it possible, usually selecting hollows of should barred
	nusilla	Rinarian trees are often chosen (Allocasuarina) Feeds mostly on nectar and nollen in the
	Little Lorikeet	canopy Protect known nesting sites during breeding season (May to September) Maintain
	(Vulnerable)	appropriate fire regimes to maintain diverse tree age classes. Protect trees with hollows by
	(,	prepping site prior to burn.
	Hieraaetus	Occupies open eucalypt forest, woodland or open woodland. Nests in tall living trees within
	mornhnoides	a remnant patch, where pairs build a large stick nest in winter. Lays two or three eggs during
	Little Eagle	spring, and young fledge in early summer. Preys on birds, reptiles and mammals,
	(Vulnerable)	occasionally adding large insects and carrion.
	Lophoictinia	Medium-sized raptor that forages over eucalypt-dominated open forests and woodlands. It
	isura	particularly favours productive forests and box-ironbark-gum woodlands. Breeds from July to
	Square-tailed	February in large stick platforms in open forest or woodland near watercourses. Avoid loss
	Kite	of nesting/feeding resources from clearing and fire. Avoid frequent fire regimes as this
	(Vulnerable)	impedes recruitment, as generation length is ~10ys.
	Melithreptus	Found in dry open forests and eucalypt woodlands, particularly communities dominated by
	gularis gularis	ironbark and box species, as well as areas where Forest Red Gum is abundant. The
	Black-chinned	species feeds on arthropods and lerps on the trunk and branches of trees, as well as nectar
	Honeyeater	from flowers and honeydew gleaned off the surface of leaves. Black-chinned Honeyeaters
Δ	(Vulnerable)	are nomadic and gregarious. The breeding season is between June and December
A	Meridolum	Primarily inhabits Cumberland Plain Woodland, Lives under litter of bark, leaves and logs, or
	corneovirens	shelters in loose soil around grass clumps. Dispersal distances are thought to be small and
	Cumperiand	there is some suggestion that gene flow between populations is low. Fires at inappropriate
	Plain Lanu	times, or too frequently, will destroy the habitat required by the species, or burn the
	(Endangered)	groundcover in which it can be sheltering, leading to direct loss of individuals.
	Mormonterus	Roosts mainly in tree hollows but will roost under bark or in man-made structures. Avoid
	norfolkensis	removing hollow-bearing trees. Avoid large scale wildfire or hazard reduction burns on
	Eastern Free-	foraging and/or roosting habitat. Highly mobile and volant feeder.
	tail Bat	······································
	(Vulnerable)	
		Protect known nesting/roosting sites (large-old hollow-bearing trees) required during winter
	Ninox strenua	spring breeding season. Avoid medium-high intensity fire in known locations during nesting
	Powerful Owl	season. Nesting occurs from late autumn to mid-winter. Avoid high intensity prescribed
	(Vulnerable)	burns or wildfires over large areas that reduce forage habitat. Maintain appropriate fire
	_	regimes within known habitat including forests and woodlands.
	Petaurus	Feeds primarily on plant and insect exudates. Dens, often in family groups, in hollows of
	australis	large trees. Very mobile and occupy large home ranges (between 20-85 ha) to encompass
	Yellow-bellied	dispersed and seasonally variable food resources. NOTE: The population at windsor downs
	Glider	Is now almost certainly extinct. Unly Cumberland reserve where they are still known from is
	(vuinerable)	Cattal NP. Probably extinct in Windsor Downs NR.
	Petroica	Prefers habitat with abundant logs and fallen timber. Birds forage from low perches, fence-
	boodang	which are taken from the ground. Sometimes forage in the shrub or capony layer. Breeds
	Scarlet Robin	mainly between July and January. Their open cup peets are often found in a dead branch or
	(Vulnerable)	in a dead tree or shrub and are usually >2 m above the ground
	Pteropus	Feed on the nectar and pollen of native trees, particularly Eucalyptus. Melaleuca and
	poliocephalus	Banksia, and fruits of rainforest trees and vines. Single young is born in October or
	Grey-headed	November. Maintain appropriate fire regimes within community thresholds for forests and
	Flying Fox	woodlands with well-developed understorey. Winter flowering species are an important
	(Vulnerable)	forage source. No known roost sites in Cumberland Area reserves.

Threatened Flora Fire Ecology					
abel	Name	Fire Ecology			
FL	Acacia pubescens Downy Wattle (Vulnerable)	Increased fire frequency may threaten the species' survival. frequent / intense burning hinders seed germination and kills liv plants. Flowers November to January.			
	Dillwynia tenuiolia (Vulnerable)	Minimum interval 8 years recommended, while 10-15 years is required to allow sufficient seed and fuel to accumulate, particularly burnt late summer to autumn. Killed by fire but regenerates from so seedbank. Prolific seed germination in response to fire. May be weak resprouter, expect most plants to be killed by mod-high intensit fire. Lifespan 20-30 yrs. Reproductive maturity occurs >4 years after germination. Flowering occurs sporadically, though peaks fror August to March.			
	Grevillea juniperina Juniper-leaved Grevillea (Vulnerable)	Plants killed by fire. Regenerates solely from soil-stored seed. F leads to a sudden increase in the recruitment of seedlings. If fires a too frequent there may be insufficient time to build up seed in the soil replace plants killed in the fire. Flowers sporadically, but pea between July and October. Arson causing frequent and intense fires listed as a threat.			
	Persoonia nutans Nodding Geebung (Endangered)	Peak flowering occurs from December to January. Reproducti maturity is not reached for 3-4 years, with peak reproduction at 5 years. Lifespan is about 20 years. Killed by fire and re-establishes fro soil-stored seed. Germination can be prolific after a moderate to hi intensity fire. There is no evidence of vegetative spread. Fire interva of 10-15 years allows adequate build-up of seed storage and fuel level to provide for moderate to high intensity bums (particularly in summ to autumn).			
	<i>Pultenaea parviflora</i> (Endangered)	Longevity may be > 50 yrs. Vegetative reproduction is probably t primary form of recruitment. It is likely that it has high seed dorman and persists in the soil via the seedbank. Seed germination is probal linked to fire. Unknown whether plants will sucker following fire. Hi intensity fires probably kill more resprouting plants, and longer perfor will be needed to recover; but, seeds in the soil may require fire sufficient intensity to break dormancy. Late summer and autumn fir are preferable. Recommend a minimum fire free period of 5-7 years allow an adequate seedbank to develop. Recommend to limit fires area until seed viability known; if viable high intervals of 20-25 year may be appropriate; mod-high intensity fires recommended.			

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Bushfire Risk Management Strategies