

MANAGEMENT TIMING ECOLOGICAL GUIDELINES

Table 1. Timing recommendations for management implementation based on ecological constraints. Insufficient data; Not recommended; Seek advice; Recommended.

Grassy Layer Type		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Comments
Fire	Native C3 Components	NE	NE	CN	CN	UN	UN	UN	UN	CN	CN	CN	UN	Fire may not be appropriate for this community type. Worth consideration to tackle dominance of annual grasses. Refs 1, 8.
	Native C4 Components	CN	BE	BE	BE	CN	CN	UN	UN	UN	CN	CN	UN	Careful consideration needed in long unburnt areas; and where there is risk of post-fire weed establishment. Refs 1, 2, 3, 4, 5, 6, 9.
Slashing	Native C3 Components	UN	UN	UN	UN	BE	BE	UN	UN	UN	CN	BE	BE	Refs 5, 13, 14.
	Native C4 Components	UN	UN	UN	UN	BE	BE	UN	UN	UN	CN	BE	BE	Refs 5, 13, 14.
Stock	Native C3 Components	BE	BE	BE	BE	BE	UN	CN	CN	CN	CN	NE	NE	Grazing in spring only if required to control annual grasses. Livestock should be removed mid October and can return mid February to limit impact on native.
	Native C4 Components	NE	NE	BE	BE	BE	UN	CN	CN	CN	CN	NE	NE	Grazing in spring only if required to control annual grasses. Livestock should be removed mid October and can return mid February to limit impact on native.

Conservation Value		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Comments	
Fire	Native Forb rich community	CN	CN	BE	BE	CN	CN	UN	UN	UN	CN	CN	CN	Refs 1, 3, 6.	
	Box-gum woodland														
	Golden Sun Moth	UN	UN	CN	CN	UN	UN	UN	UN	UN	CN	CN	NE	Burn in spring only where herbage mass is too high for GSM. Ref 1.	
	Striped Legless Lizard	CN	CN	BE	BE	UN	UN	UN	UN	UN	CN	CN	CN	Refs 1, 10.	
	Pink-tailed Worm-lizard	OK	OK	UN	UN	OK	OK	OK	NE	NE	NE	CN	OK	PTWL can be killed by fire (W Osbourne, pers. comm). Ref 16.	
	Grassland Earless Dragon	UN	UN	CN	CN	CN	UN	UN	UN	UN	CN	CN	UN	GED can be killed by fire (Robertson and Cooper, 1997). Fire can improve habitat quality for GED Ref 1.	
	Button Wrinklewort	UN	UN	CN	CN	CN	UN	UN	UN	UN	NE	NE	NE	UN	Ref 19.
	Ginninderra Peppergrass	UN	UN	CN	CN	CN	UN	UN	UN	UN	NE	NE	NE	NE	Smoke can increase germination rates. Ref 18.
Superb parrot	UN	UN	UN	UN	OK	OK	OK	UN	CN	NE	CN	NE	UN	Ref 15.	
Slashing	Native Forb rich community	UN	UN	UN	UN	BE	BE	UN	UN	UN	UN	CN	BE	Refs 3, 13.	
	Box-gum woodland														
	Golden Sun Moth	CN	CN	UN	UN	CN	CN	CN	UN	BE	BE	NE	NE	Slashing in spring only if herbage mass too high for GSM (A Rowe, pers. comm).	
	Striped Legless Lizard	UN	UN	UN	UN	UN	UN	UN	UN	UN	UN	UN	UN		
	Pink-tailed Worm-lizard	OK	OK	UN	UN	OK	OK	OK	NE	NE	NE	CN	OK	Slashing risks disturbing habitat rocks and is not permitted within PTWL habitat. Brushcutting within PTWL is permitted. Ref 16.	
	Grassland Earless Dragon	UN	UN	UN	UN	UN	UN	UN	UN	UN	UN	UN	UN		
	Button Wrinklewort	NE	CN	CN	CN	CN	UN	UN	UN	UN	NE	NE	NE	Ref 19.	
	Ginninderra Peppergrass	NE	CN	CN	CN	CN	UN	UN	UN	UN	NE	NE	NE		
Superb parrot	UN	UN	UN	UN	OK	OK	OK	UN	CN	NE	CN	NE	Ref 15.		
Stock	Native Forb rich community	NE	NE	BE	BE	BE	CN	CN	CN	CN	CN	NE	NE	Providing a respite from grazing for at least 3 months is important. Spring grazing only to tackle annual grass dominance. Livestock should be removed mid October	
	Box-gum woodland														
	Golden Sun Moth	OK	OK	OK	OK	OK	CN	CN	CN	OK	NE	NE	OK	Avoid grazing with cattle/horses if soil is wet, or when moths are flying (Oct/Nov).	
	Striped Legless Lizard	OK	OK	OK	OK	OK	CN	CN	CN	OK	OK	OK	OK	Avoid grazing with cattle and horses if soil is wet.	
	Pink-tailed Worm-lizard	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK		
	Grassland Earless Dragon	NE	NE	OK	OK	OK	CN	CN	CN	OK	OK	NE	OK	Avoid grazing during hatching (Jan/Feb), if soil is wet with cattle/horses (Jun-Aug), or when dragons are laying (Nov).	
	Button Wrinklewort	NE	NE	CN	CN	CN	UN	UN	UN	UN	NE	NE	NE	Ref 19.	
	Ginninderra Peppergrass	NE	NE	CN	CN	CN	UN	UN	UN	UN	NE	NE	NE		
Superb parrot	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Compatible but not undertaken for the superb parrot		

KEY	
Action likely to have a benefit	BE
Action may have a benefit but consideration needed.	CV
Action likely to have a negative impact	NE
Action unlikely to impact	OK
Impact unknown	UN

NEED TO INSERT REFERENCES HERE

HERBAGE MASS MANAGEMENT GUIDELINES

SPECIES SPECIFIC MANAGEMENT RECOMMENDATIONS

Management outputs from the Herbage Mass Decision Framework and timing guidelines should be further guided by the specific habitat requirements for species known to occur within the management unit. The following supplementary information outlines specific management considerations for each species of interest.

HERBAGE MASS MANAGEMENT GUIDELINES

GOLDEN SUN MOTH

HABITAT REQUIREMENTS

- Wallaby grasses appear primary native food plant. Chilean needle grass also provides habitat but at the loss of other native species.
- Aim to maintain grassland habitat with inter-tussock spaces of short grasses/forbs or bare ground with low thatch cover. Avoid a long, dense sward with no inter-tussock spaces.
- It is important to avoid long, dense grass in Golden Sun Moth habitat during the spring/summer breeding season (October to January), when flying males are actively searching for non-flying females on the ground. However, Golden Sun Moths are probably relatively tolerant of longer grass outside the breeding season (when the species is present as subterranean larvae amongst the roots of grasses).
- Priority should be given to *Rytidosperma* dominated patches, within *Austrostipa* or *Themeda* dominated communities, based on the feeding preferences of larvae. CNG can also support this species in the larval stage. Exotic dominated pastures will require restoration of >10%.
- Recognised optimal habitat values are 4-8cm for grass height, 5-25% for bare ground, less than 30% thatch cover and thatch depth less than 1cm.

GRAZING

- Light or intermittent grazing is preferable, timed to avoid excessive trampling during the Golden Sun Moth breeding period in late October to January (Alcock 2017).
- Light grazing is permitted within the breeding season if the grass sward is tall and dense (>20 cm, bare ground <5%). This is preferable to leaving a long, dense sward for the remainder of the breeding
- In CNG dominated habitat graze in winter or early spring where possible, before the seeding period of the grass (ACT Government 2017).
- The average tussock height should not be reduced below 5 cm during grazing, with an ideal range between 4-8 cm grass height (B. Howland, pers comm).
- The relatively low productivity of most many *Rytidosperma* sp. (< 10 kg/ha/day) should be considered when considering appropriate grazing pressure. Some of these grasses are naturally low growing, and excessive grazing pressure may negatively impact on inter-tussock soil crust.

FIRE

- Impact of burns unknown, but can assume best season to burn is outside emergence (November - January) (Corrigan et al 2018).
- Patchy, low intensity burns restricted to between March - September (ACT Government 2107).
- GSM occupy areas of short grass that will not easily burn (Corrigan et al 2018).
- Burning promotes Chilean Needlegrass (Brawata et al 2017).
- Burning can be used to reduce the build of thatch which is known to disadvantage the species.

SLASHING

- When slashing, tussock height should be maintained at **5 cm** or above, with an ideal range between 5-10cm (ACT Government 2017).
- Slashing should be undertaken before November but if the grass sward is tall and dense (>10cm, bare ground <5%) during the Golden Sun Moth breeding season then slashing is preferable to leaving a long, dense sward for the remainder of the breeding season.
- Slashing between November and January should not be undertaken in any other circumstances than described above.
- Litter should be removed to expose inter-tussock space where slashing is used.

HERBAGE MASS MANAGEMENT GUIDELINES

STRIPED LEGLESS LIZARD

HABITAT REQUIREMENTS

- Preferred mix of grass communities ~~pastures~~. Some evidence for preference for tufted native grasses – including Bothriochloa and Themeda species ~~red grass, kangaroo grass~~. Can also be found in exotic grasses (Phalaris, Avenaphalaris, wild oats) near patches of native grass.
- Aim to maintain a mosaic or 'patchy' habitat structure that has an intermediate to moderately high grass herbage biomass (Howland et al 2016).
- Where it is impractical to reduce the herbage biomass of patches of tall dense grass (such as exotic Phalaris in moist drainage lines), aim to provide more suitable habitat patches (intermediate herbage grass biomass) adjacent to the patches of long, dense grass.
- At herbage biomass levels at or above the High Tolerable Zone restrict to no more than 20% of the habitat area. ~~In SOE grazing pressure recommended at 0.5-1.5 DSE or 1-3 kangaroos per/ha (Howland et al 2016).~~

GRAZING

- Grazing by native herbivores is the preferred method for managing grass structure and herbage biomass, because it creates a heterogeneous habitat (patches of short and long grass).
- Stock grazing can be used as a herbage biomass management strategy at sites that have a history of stock grazing, where grazing by native herbivores is insufficient to control herbage grass biomass (Howland et al 2016). Sheep should be used in preference to cattle, which can compact soil and impact burrows.
- Stock grazing at low intensity (ACT Government 2005).

FIRE

- ~~Where burns are determined as necessary, burns:~~ Burns should be undertaken to create a patchy mosaic of burnt and unburnt areas at a fine-scale and aim for 30%-50% area unburnt (80% unburnt) in each burn patch.
- At least 3 year interval between burns in Phalaris dominated grasslands (Howland et al 2016).
- Burn patches of up to 30 m diameter are likely to be an appropriate size in habitat for threatened grassland lizards.
- Burns should be restricted to one or more small patches at a site .
- Burns should be low-intensity and conducted during the middle of the day or in the afternoon, rather than early morning when the lizards may be cold and slow moving (Corrigan et al 2018).
- Burns should be restricted to early spring (September - October), before the summer breeding season, or early autumn (March - April) to ensure sufficient regrowth of vegetation before winter (Corrigan et al 2018).

SLASHING

- If slashing grass should not be slashed below 20 cm in height (Howland et al 2016).
- Slashing should be avoided - minimised in active season of spring & summer . and undertaken slash in warm parts of day (Howland et al 2016).
- Slashing should be used to limit the recruitment of introduced species that threaten the open inter-tussock structure, such as Wild Oats, St Johns Wort, Saffron Thistle, and introduced perennial grasses.

HERBAGE MASS MANAGEMENT GUIDELINES

PINK-TAIL WORM-LIZARD

HABITAT REQUIREMENTS

- Excess herbage plant biomass is a threat to the Pink-tailed Worm-lizard in its habitat. Dense tall clumps or swards of plant material smother the rocks and open spaces, preventing direct sunlight from warming the rocks and ground, and making the habitat less suitable for the ants on which the lizards depend. Dense plant material can also depress the diversity of forbs, subshrubs and graminoids typical of high or moderate quality habitat.
- Large tussocks at >10% cover desired, including Kangaroo Grass (*Themeda triandra*) where it is present. ~~In SOE grazing pressure recommended at 0.5-1.5 DSE or 1-3 kangaroos per/ha.~~

GRAZING

- Avoid using livestock grazing until after native seed has set, unless earlier grazing is likely to defoliate and prevent seed-set in exotic plant species in the area, especially annual grasses (EMG).
- Do not allow grazing to reduce tussocks to <10 cm height, to maintain tussock structure and inter-tussock spaces.
- Remove stock if grazing is having an adverse impact on the habitat rocks, grass structure and vegetation.

FIRE

- Conduct burns in winter or summer when the lizards are likely to be deeper in their burrows. ~~A, and~~ avoid burning in the period when the lizards shelter at the immediate underside of rocks (BMP).
- If possible burn during the middle of the day or evening rather than early morning when lizards might be cold and slow moving.
- Undertake prescribed burns in Pink-tailed Worm-lizard habitat at a maximum rate of once every 3–10 years (ACT Government 2017).

SLASHING

- Do not undertake mechanised slashing in high- and moderate-quality Pink-tailed Worm-lizard habitat (ACT Government 2017).
- Slash by hand (e.g. brushcutter) and remove the plant material, to target patches of weeds and tall and dense grass (ACT Government 2017).
- Slashing or mowing in high- and moderate-quality habitat for Pink-tailed Worm-lizard risks disturbing rocks and introducing highly invasive weeds.
- Machinery can be used for slashing within the buffer zones around high- and moderate-quality habitat, to reduce herbage biomass, ~~and~~ fire fuel loads and weeds; any machinery should be thoroughly cleaned before entry to avoid bringing in weed seed.

HERBAGE MASS MANAGEMENT GUIDELINES

GRASSLAND EARLESS DRAGON

HABITAT REQUIREMENTS

- Wallaby and spear grass communities in higher quality natural temperate grasslands.
- Aim to maintain grassland habitat as tussocks with inter-tussock spaces of short grass/forbs or bare ground. A mosaic or 'patchy' habitat structure is best - that is, patches of dense tussocks mixed with patches of sparse tussocks. Avoid creating a grassland that is mostly a long, dense sward with no inter-tussock spaces. ~~In SOE grazing pressure recommended at 1-2.5 DSE or 2-5 kangaroos per/ha.~~

GRAZING

- Grazing by native herbivores is the preferred method for managing grass structure and ~~herbage bio~~mass, because it creates a heterogeneous habitat (patches or dense tussocks and patches of sparse tussocks).
- Stock grazing can be used as a ~~herbage bio~~mass management strategy at sites that have a history of stock grazing, where grazing by native herbivores is insufficient to control ~~herbage grass bio~~mass. Sheep should be used in preference to cattle, which can compact soil and impact burrows.
- Light stock grazing March to October if grass sward is tall and dense (>10 cm, bare ground <5%).
- Light grazing is permitted within the breeding season (November - February) if the grass sward is tall and dense (>20 cm, bare ground <5%). This is preferable to leaving a long, dense sward for the remainder of the breeding season (Alcock 2017).

FIRE

- If burning is used as a ~~herbage bio~~mass management strategy, burns should be patchy and occur in the afternoon on warm days when lizards are active.
- Burns should be restricted to one or more small patches at a site and aim for 30% - 50% area unburnt in each burn patch).

SLASHING

- If slashing is used as a ~~herbage bio~~mass management strategy, it should occur in the afternoon on warm days when lizards are most active.
- Grass should not be slashed below 10 cm, to help avoid direct impacts to GED.

OTHER SPECIES OF CONCERN

Button Wrinklewort (ACT Government 2017)

Occurs in shallows soils of NTG, secondary derived grasslands and margins of grassy box woodlands. Critical life history periods are between December and April when plants are flowering and fruiting, and June to July when germinating. Herbage mass management activities should not be conducted during these periods unless biomass is very high. Kangaroo grazing is the preferred herbage mass management as kangaroos selective graze grasses. Intermittent burning on a small scale may be of some advantage to reduce competition. Occasional late summer high slashing may be used to reduce herbage mass. Late summer light to moderate sheep grazing may not be detrimental.

Ginninderra Peppergrass (ACT Government 2017)

Only found at Lawson and Franklin grasslands in Rytidosperma NTG. Critical life history periods are during late spring when plants are flowering and throughout December for seed set. Kangaroo grazing is the preferred herbage mass management as kangaroos selective graze grasses. Response to ecological burns is unknown. Populations have persisted in areas where slashing was used to reduce herbage mass. Populations have also persisted in areas of light sheep grazing to reduce herbage mass.

Perunga Grasshopper (ACT Government 2017)

Occurs in NTG of low to moderate grass biomass. The critical life history period is during late summer and autumn when nymphs are hatching. Response to ecological burns is unknown. Populations have persisted in areas where slashing was used to reduce herbage mass. Populations have also persisted in areas of light sheep grazing to reduce herbage mass.

Superb Parrot (ACT Government 2015)

Excess biomass restricts diversity, access, visibility and air-movement in grassy areas that Superb Parrots might use for foraging. Avoid biomass manipulation activities during the breeding season in areas where Superb Parrot may be nesting. Slashing can reduce the seed supply for ground-feeding fauna including Superb Parrot.

PRIORITISATION FRAMEWORK

As the final step in the herbage mass management plan, a prioritisation framework was developed to assist in prioritising land management activities across the ACT Government managed conservation estate. This process involved ranking reserves within Canberra Nature Park based on their biodiversity values (scored based on the presence of individual listed species, plus the total area of endangered ecological community divided by 10), strategic conservation importance (e.g. contribution to landscape connectivity, core habitat value, etc.; score 0-3), relative risk (in terms of the perceived resilience of the sites conservation values; score 0-3), and prior and ongoing management investment (e.g. active parkcare group, prior investments in weed or kangaroo management; score 0-3). Each of these scores was then added together to give a total score for the reserve, and sites were then ranked based on this score. A scaled score, based on the score for each reserve divided by the score achieved at Mulligans Flat (the highest ranked reserve), was also calculated to give an indication of the relative values contained within each site (Table 2).

Table 2 (following page). Reserve prioritisation list for Canberra Nature Park reserves and Googong.

Abbreviations include Box-gum Woodland (BGW), Natural Temperate Grassland (NTG) and Endangered Ecological Community (EEC). Comments are provided to support the investment commitments score for each reserve.

HERBAGE MASS MANAGEMENT GUIDELINES

Site Name	BCW	NTG	Total EEC	Extent of EEC (0-3)	Buton_Wrinklewort (score 2)	Grassland_Earless_Dragon (score 3)	Grimmiaera_Peppercress (score 2)	Golden_Sun_Moth (score 2)	Hooded_Robin (score 1)	Scarlet_Robin (score 1)	Perunga_Grasshopper (score 2)	Pink_tailed_Worm_Lizard (score 2)	Small_Purple_oea (score 2)	Striped_Legless_Lizard (score 3)	Canberra_Raspy_Cricketer (score 2)	Key_s_Matchstick_Grasshopper (score 2)	Hoary_Sunray (score 1)	Threatened_orchids (score 1)	Here_Plant_Score (score 0-3)	Biodiversity Values (0-27)	Strategic Conservation Importance (0-3)	Relative Risk (0-3)	Prior and Ongoing Investment (0-3)	TOTAL SCORE	SCALED SCORE	Investment comments
MULLIGANS FLAT NATURE RESERVE	652.3		652.3	65.2	0	0	0	2			2	0	0	0	2	1	0	0	72	3	3	3	3	81.2	1.00	Sanctuary fence, roos managed
GOOGONG FORESHORES	0		650	65.0	2	0	0	2			2	2	0	2	0	0	0	0	75	2	1	2	2	80.0	0.98	Roos management, water catchment
GOOROYARROO NATURE RESERVE	443.3		443.3	44.3	0	0	0	2			2	0	0	3	0	0	1	0	52	3	3	3	3	61.3	0.75	Sanctuary fence, roos managed
MOUNT AINSLIE NATURE RESERVE	408.8	0.847	409.7	41.0	2	3	0	2			0	0	0	3	0	0	1	1	53	1	2	1	1	57.0	0.70	Parkcare?, roos managed
MOLONGLO RIVER RESERVE	256.7		256.7	25.7	0	0	0	2			2	1	0	0	0	0	1	0	32	3	1	3	3	38.7	0.48	Restoration efforts
JERRABOMBERRA WEST GRASSLANDS NATURE RESERVE	80.07	111.3	191.3	19.1	0	3	0	2			2	1	0	3	2	0	1	0	33	1	2	1	1	37.1	0.46	Fire regime to restore GED habitat
MOUNT MAJURA NATURE RESERVE	226.7		226.7	22.7	0	0	0	2			0	0	0	0	0	0	1	1	27	1	2	3	3	32.7	0.40	Parkcare ++, Roos management underway
RED HILL NATURE RESERVE	211.1		211.1	21.1	2	0	0	0			2	0	0	0	0	0	0	0	25	1	2	3	3	31.1	0.38	Parkcare ++
JERRABOMBERRA EAST GRASSLANDS NATURE RESERVE	0.03	22.21	22.24	2.2	2	3	2	2			2	0	0	3	2	0	0	0	18	3	3	2	2	26.2	0.32	Started roos management, some translocations?
CRACE GRASSLANDS NATURE RESERVE	1.233	36.27	37.5	3.8	2	0	2	2			2	0	0	3	2	0	0	0	17	2	3	2	2	23.8	0.29	Plant translocations?, roos managed
KAMA NATURE RESERVE	113.1	36.63	149.7	15.0	0	0	0	0			0	1	0	0	0	0	1	0	17	2	1	2	2	22.0	0.27	SL translocations? Roos managed
GUNGADERRA GRASSLANDS NATURE RESERVE	24.84	34.65	59.49	5.9	0	0	0	2			2	0	2	3	0	0	0	0	15	2	3	2	2	21.9	0.27	Roos managed
MOUNT MUGGA MUGGA NATURE RESERVE	121.2		121.2	12.1	0	0	0	0			2	1	0	0	0	0	1	0	16	1	2	1	1	20.1	0.25	Tree thinning (relevance?)
DUNLOP GRASSLANDS NATURE RESERVE	24.5	76.99	101.5	10.1	0	0	2	2			0	0	0	0	2	0	0	0	16	1	1	1	1	19.1	0.24	
MULANGGARI GRASSLANDS NATURE RESERVE	18.27	11.99	30.25	3.0	0	0	0	2			2	0	0	3	2	0	0	0	12	2	3	2	2	19.0	0.23	Roos managed
KINLYSIDE NATURE RESERVE	113.4		113.4	11.3	0	0	0	2			0	1	0	0	0	0	0	0	14	1	1	2	2	18.3	0.23	
TUGGERANONG HILL NATURE RESERVE	132.8		132.8	13.3	0	0	0	0			0	1	0	0	0	0	1	0	15	1	2	0	0	18.3	0.22	
CALLUM BRAE NATURE RESERVE	120.1		120.1	12.0	0	0	0	0			0	0	0	0	0	0	1	0	13	1	2	1	1	17.0	0.21	Prior roos management attempts (unsuccessful)
FARRER RIDGE NATURE RESERVE	83.45		83.45	8.3	0	0	0	0			0	1	2	0	0	0	1	0	12	1	2	0	0	15.3	0.19	
ISAACS RIDGE NATURE RESERVE	81.27		81.27	8.1	0	0	0	0			0	1	2	0	0	0	1	0	12	1	2	0	0	15.1	0.19	
NORTH MITCHELL GRASSLANDS	2.119	3.794	5.913	0.6	0	0	2	2			0	0	0	3	0	0	0	0	8	3	3	1	1	14.6	0.18	
URAMBI HILLS NATURE RESERVE	114.3		114.3	11.4	0	0	0	0			0	1	0	0	0	0	0	0	12	1	1	0	0	14.4	0.18	
MOUNT TAYLOR NATURE RESERVE	53.06		53.06	5.3	0	0	0	0			0	1	2	0	0	0	0	0	8	1	2	2	2	13.3	0.16	Parkcare
BLACK MOUNTAIN NATURE RESERVE	7.906		7.906	0.8	0	0	0	0			0	1	2	0	0	0	1	1	6	2	2	2	2	11.8	0.15	Parkcare
THE PINNACLE NATURE RESERVE	52.2		52.2	5.2	0	0	0	0			0	1	0	0	0	0	0	0	6	1	2	2	2	11.2	0.14	Parkcare, roos managed
COOLEMAN RIDGE NATURE RESERVE	78.41		78.41	7.8	0	0	0	0			0	1	0	0	0	0	1	0	10	1	?	?	0	10.8	0.13	
WANNIASSA HILL NATURE RESERVE	44.39		44.39	4.4	0	0	0	0			0	0	2	0	0	0	1	0	7	1	2	0	0	10.4	0.13	
ARANDA BUSHLAND NATURE RESERVE	27.87	4.407	32.27	3.2	0	0	0	0			0	0	0	0	0	0	0	0	3	2	2	2	2	9.2	0.11	Parkcare, initiated roos management
MOUNT PLEASANT NATURE RESERVE	33.69		33.69	3.4	0	0	0	0			0	0	0	0	0	0	1	0	4	1	2	0	0	7.4	0.09	
MOUNT PAINTER NATURE RESERVE	23.42		23.42	2.3	0	0	0	0			0	0	0	0	0	0	0	0	2	1	2	2	2	7.3	0.09	Parkcare, roos managed
JARRAM LEE NATURE RESERVE	19.08	3.796	22.87	2.3	0	0	0	2			0	0	0	0	2	0	0	0	6	1	?	?	0	7.3	0.09	
PERCIVAL HILL NATURE RESERVE	21.19	1.113	22.3	2.2	0	0	0	0			0	0	0	3	0	0	1	0	6	1	?	?	0	7.2	0.09	
JERRABOMBERRA WETLANDS NATURE RESERVE	9.823		9.823	1.0	0	0	0	0			0	0	0	0	0	0	0	0	1	3	2	1	1	7.0	0.09	Trust
GOSSAN HILL NATURE RESERVE	11.39		11.39	1.1	0	0	0	0			0	0	0	0	0	0	1	0	2	1	2	0	0	5.1	0.06	
KOWEN ESCARPMENT NATURE RESERVE	8.04		8.04	0.8	0	0	0	0			0	0	0	0	0	0	0	1	2	1	2	0	0	4.8	0.06	
BRUCE RIDGE NATURE RESERVE	13.34		13.34	1.3	0	0	0	0			0	0	0	0	0	0	0	0	1	1	2	0	0	4.3	0.05	
OAKLEY HILL NATURE RESERVE	0.524		0.524	0.1	0	0	0	0			0	1	0	0	0	0	0	0	1	1	2	0	0	4.1	0.05	
O CONNOR RIDGE NATURE RESERVE	8.948		8.948	0.9	0	0	0	0			0	0	0	0	0	0	0	0	1	1	2	0	0	3.9	0.05	
MCQUOIDS HILL NATURE RESERVE	18.18		18.18	1.8	0	0	0	0			0	1	0	0	0	0	0	0	3	1	?	?	0	3.8	0.05	

HERBAGE MASS MANAGEMENT GUIDELINES

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HERBAGE MASS MANAGEMENT GUIDELINES

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HERBAGE MASS MANAGEMENT GUIDELINES

From: [REDACTED]
Sent: Sat, 20 Jan 2024 06:54:31 +1100
To: Nguyen, William; Wimpenny, Claire
Subject: RE: Eastern Grey Kangaroo vehicle collision numbers for 2016 to 2023

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That's magic, thanks Will!
S

From: Nguyen, William <William.Nguyen@act.gov.au>
Sent: Friday, January 19, 2024 5:30 PM
To: [REDACTED] Wimpenny, Claire <Claire.Wimpenny@act.gov.au>
Subject: RE: Eastern Grey Kangaroo vehicle collision numbers for 2016 to 2023

Hi Sarah,

As promised here are the Wildlife Callouts EGK only :

Month	2016								Grand Total
	2017	2018	2019	2020	2021	2022	2023		
Jan	132	185	193	104	336	66	73	120	1209
Feb	91	323	223	162	366	50	92	136	1443
Mar	127	297	147	148	107	81	124	226	1257
Apr	249	96	254	179	81	96	103	174	1232
May	330	150	444	221	98	102	141	198	1684
Jun	355	138	573	271	120	125	146	256	1984
Jul	503	219	677	401	117	122	195	340	2574
Aug	339	337	558	472	156	170	174	346	2552
Sep	166	288	368	368	129	108	157	396	1980
Oct	220	179	271	343	103	108	117	614	1955
Nov	141	190	212	406	56	88	158	315	1566
Dec	122	120	124	371	62	104	199	176	1278
Grand Total	2775	2522	4044	3446	1731	1220	1679	3297	20714

Have a great weekend!

William Nguyen

Project Ranger | Canberra Nature Park South | ACT Parks & Conservation

Athllon Depot - Cnr Athllon Dr & Sulwood Dr, FARRER ACT 2607

M: [REDACTED] | P: 02 6207 3355 | E: William.Nguyen@act.gov.au



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Government



From: [REDACTED]

Sent: Monday, 15 January 2024 4:03 PM

To: Nguyen, William <William.Nguyen@act.gov.au>; Wimpenny, Claire <Claire.Wimpenny@act.gov.au>

Subject: RE: Eastern Grey Kangaroo vehicle collision numbers for 2016 to 2023

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Hi Will

Thanks heaps. If you are time pressed, the priority years are 2023, then 2022, in that order, filtered to EGK only.

Many thanks
Sarah

From: Nguyen, William <William.Nguyen@act.gov.au>

Sent: Monday, January 15, 2024 12:20 PM

To: s [REDACTED] Wimpenny, Claire <Claire.Wimpenny@act.gov.au>

Subject: RE: Eastern Grey Kangaroo vehicle collision numbers for 2016 to 2023

Hi Sarah,

Give me till the end of this week at the latest and I'll clean up some data for you to the end of 2023 and will be able to start giving you complete figures then.

I'm not familiar with the Cope and Herbert report but if they used our data perhaps they filtered to specifically EGK, I usually report by Macropods as a whole as requested by the rangers.

We don't actually specify if it was a car crash or not but rangers have always said that pretty much 99% of the data we collect are car crashes so you can pretty much assume it's a car crash with a the odd outlier.

I hope that gives you a bit of clarity but let me know if I missed anything.

Cheers!

William Nguyen



ACT
Government



From: [REDACTED] >

Sent: Tuesday, 9 January 2024 10:47 AM

To: Wimpenny, Claire <Claire.Wimpenny@act.gov.au>; Nguyen, William <William.Nguyen@act.gov.au>

Subject: RE: Eastern Grey Kangaroo vehicle collision numbers for 2016 to 2023

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Hi Will

Cc Claire

Hope you had a nice holiday break!

I had a go at getting this data summary myself, by downloading the wildlife callout data, filtering for EGK, then tabulating the callouts by year. I noticed a couple of things:

- The numbers for 2022 and especially 2023 are low – is this because these later data are not yet available in the downloadable spreadsheet?
- Also, Claire shared the Cope and Herbert report with me, and their numbers for callouts are a bit smaller than in my tabulation (their report only states the EGK-specific data for 2016-19). Perhaps they did some extra filtering/data cleanups that sharpened the numbers – for example from Claire’s email, I take it that not all callouts are for a vehicle collision?

Any insights appreciated.

Thanks

Sarah

Year	My tabulation	Cope and Herbert
2016	2775	2531
2017	2522	2271
2018	4044	3652
2019	3446	3003
2020	1731	
2021	1221	
2022	1679	

From: Wimpenny, Claire <Claire.Wimpenny@act.gov.au>
Sent: Saturday, December 23, 2023 6:31 PM
To: Nguyen, William <William.Nguyen@act.gov.au>
Cc: [REDACTED]
Subject: Eastern Grey Kangaroo vehicle collision numbers for 2016 to 2023

OFFICIAL

Hi Will,

Assuming you won't see this until January, I hope you had a lovely Christmas/New Year break!

At some time in early January would you please be able to provide a summary table from the Wildlife Callout Database to Sarah Legge who is currently undertaking an independent review of the Eastern Grey Kangaroo Controlled Native Species Management Plan?

She is after the annual number of Eastern Grey Kangaroo records related to motor vehicle collisions only. Is that possible? I assume there is field that distinguishes vehicle collisions from other reasons for ranger attendance?

I have cc'd Sarah into this email because I will be away at the beginning of January so if you could send the table directly to her, that would be great.

Thanks!

Claire Wimpenny

Senior Ecologist

Office of Nature Conservation | Environment, Heritage and Water Division | Environment, Planning and Sustainable Development Directorate (EPSDD) | ACT Government

Phone +61 2 6205 8252 | Email claire.wimpenny@act.gov.au

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From: [REDACTED]
Sent: Mon, 22 Jan 2024 08:49:27 +1100
To: EPSDD PCS LC
Subject: RE: roo management

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Brilliant, thanks Edana.
Sarah

From: EPSDD PCS LC <PCS.LicensingandCompliance@act.gov.au>
Sent: Saturday, January 20, 2024 8:50 AM
To: [REDACTED]
Cc: Bauer, Jo-Anne <Jo-Anne.Bauer@act.gov.au>; McIntosh, Sally <Sally.McIntosh@act.gov.au>
Subject: RE: roo management

OFFICIAL

Thanks Sarah, I'm looking forward to it!

That's great about the positive feedback from landholders. This year we are going back to a simplified smartform so it should be easier for them. The ones that struggle online we are always happy to help them fill it in over the phone.

I'm unaware of a situation where a shooter/farmer has failed an audit during my time in Licensing however that's not to say it hasn't. Sal would more likely have records on that. For more detailed maximum penalties that could apply to landholders and shooters and likely regulatory actions I would follow up with my manager Jo-Anne.Bauer@act.gov.au. If it was an offence under the Firearms Act instead of directly relating to our Authorisation we would refer that to ACT Policing.

Kind regards,

Edana Sinclair | Licensing Officer

Licensing and Compliance | Environment, Heritage & Water Division
Environment, Planning and Sustainable Development Directorate | ACT Government
Phone: **02 6207 6376** | Email: pcs.licensingandcompliance@act.gov.au
Location: Stromlo Depot, 500 Cotter Rd, Weston Creek | Postal: GPO Box 158, Canberra ACT 2601 |
<http://www.environment.act.gov.au/>



From: [REDACTED] >
Sent: Friday, January 19, 2024 1:25 PM
To: EPSDD PCS LC <PCS.LicensingandCompliance@act.gov.au>
Subject: RE: roo management

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Hi Edana
Oh that's lovely – have a great time!

I mostly wanted to get your feeling for how the authorisation to cull roos on rural lands operated, whether you thought there were any bugs to iron out etc.

Fyi - The farmers that ive talked to seem very happy with how it all works, and very happy with the staff they interact with. A couple of them said the forms they need to fill in are clunky, and perhaps you could have them autofilled.

You might be able to reply to one question by email: what happens when farmers/shooter fails an audit of the culling operations? I imagine you don't want them to stop culling, as it would lead to a bigger problem, so what happens? Is it a fine for example? And does it happen rarely?

Best regards
Sarah

Professor (Wildlife Conservation) Charles Darwin University
Honorary Professor, The Australian National University
Principal Research Fellow, University of Queensland
Biodiversity Councillor
Co-editor in chief, Wildlife Research
[REDACTED]

From: EPSDD PCS LC <PCS.LicensingandCompliance@act.gov.au>
Sent: Thursday, January 18, 2024 9:22 PM

To: [REDACTED]
Subject: RE: roo management

OFFICIAL

Hi Sarah,

Apologies, I've run out of time [REDACTED]
[REDACTED] and could potentially have a discussion on teams
around mid Feb, if we can take into account the time difference?

Otherwise I'll be back to work 12th March. Not sure when you need to have any information back by?

If you have specific questions you can email them through and I can try my best to answer quicker via email? My manager is Jo-anne.bauer@act.gov.au who may also be able to help, however she is new to the role and has not yet had involvement in the Kangaroo Management Plan so would need to research instead of speaking from experience.

Kind regards,

Edana Sinclair | Licensing Officer

Licensing and Compliance | Environment, Heritage & Water Division

Environment, Planning and Sustainable Development Directorate | ACT Government

Phone: 02 6207 6376 | Email: pcs.licensingandcompliance@act.gov.au

Location: Stromlo Depot, 500 Cotter Rd, Weston Creek | Postal: GPO Box 158, Canberra ACT 2601 |

<http://www.environment.act.gov.au/>



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From: [REDACTED] >
Sent: Wednesday, January 17, 2024 2:47 PM
To: Sinclair, Edana <Edana.Sinclair@act.gov.au>
Subject: roo management

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Hi Edana

I hope this finds you well. As you might know, I'm carrying out the independent review of the ACT kangaroo management plan. Sally passed on your details because I'm keen to talk to someone in licencing and compliance to understand a little more about how that side of things work.

Could we line up a time to chat? I will actually be in the Dickson offices on Friday, so potentially we could chat around 2? Or possibly at 4.30? if those times don't work, we can chat by zoom or teams next week.

Sarah

Professor (Wildlife Conservation) Charles Darwin University
Honorary Professor, The Australian National University
Principal Research Fellow, University of Queensland
Biodiversity Councillor
Co-editor in chief, Wildlife Research


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From: Evans, Hannah
Sent: Tue, 13 Feb 2024 03:09:07 +0000
To: Wimpenny, Claire
Subject: RE: EGK Plan Independent review - DRAFT FOR COMMENT

OFFICIAL


Thanks Claire,

I have done a PR check and added some comments throughout for your consideration. This is a really great piece of work with some clear actions for comms. I will provide an update/ summary to Amy/ Alex and let you know next steps from our end (e.g., new draft web content).

Djan Yimaba Yara (*Thank you and Bye in Ngunnawal language*),

Hannah Evans (she/her)

Assistant Director, Communications and Engagement – Environment, Heritage and Water

 [Microsoft Teams](#) | T: (02) 6207 2993 | EPSDD Media mobile: 0401 766 218

Communications, Engagement and Media | Environment, Planning and Sustainable Development Directorate | ACT Government

Level 4 (Snow Gum), 480 Northbourne Avenue, Dickson 2602 | GPO Box 158 Canberra ACT 2601

www.environment.act.gov.au | www.planning.act.gov.au | www.climatechoices.act.gov.au

I acknowledge the Ngunnawal people as traditional custodians of the land and recognise any other people or families with connection to the lands of the ACT and region. I wish to acknowledge and respect their continuing culture and the contribution they make to the life of this city and this region.

From: Wimpenny, Claire <Claire.Wimpenny@act.gov.au>

Sent: Tuesday, February 6, 2024 5:09 PM

To: Evans, Hannah <Hannah.Evans@act.gov.au>

Subject: FW: EGK Plan Independent review - DRAFT FOR COMMENT

OFFICIAL

Regards,

Claire Wimpenny

Senior Ecologist

Office of Nature Conservation | Environment, Heritage and Water Division | Environment, Planning and Sustainable Development Directorate (EPSDD) | ACT Government

Phone +61 2 6205 8252 | Email claire.wimpenny@act.gov.au

480 Northbourne Avenue, Dickson ACT 2602 | GPO Box 158 Canberra ACT 2601 | www.environment.act.gov.au

From: Wimpenny, Claire

Sent: Tuesday, February 6, 2024 12:04 PM

To: McIntosh, Sally <Sally.McIntosh@act.gov.au>; Sweaney, Mark <Mark.Sweaney@act.gov.au>; Arguelles, Rheyda <Rheyda.Arguelles@act.gov.au>; Cooney, Rosie <Rosie.Cooney@act.gov.au>; Keighley, Miles <Miles.Keighley@act.gov.au>; Glennon, Chris <Chris.Glennon@act.gov.au>; Driver, Kyelee <Kyelee.Driver@act.gov.au>

Subject: EGK Plan Independent review - DRAFT FOR COMMENT

OFFICIAL

Hi all,

Sarah has just sent through her draft review report for comment, see attached.

Could you all please review the document and provide any comments/edits in track changes? I am hoping to get **comments by next Friday 16th Feb** at the latest if possible, with the aim of having the report finalised by the end of February. Let me know if this timing doesn't work for you (noting the report is about 100 pages long).

Kyelee – Sarah has asked if you could please review Sections 5.6 and 6.1. These are the sections that include the information you discussed with her. Feel free to comment on the rest of it if you like, but completely understand if you don't have time.

I will also send a copy to the Conservator's team to see if they want to comment and to send on to Minister Vassarotti's office.

Let me know if you think the draft should go to anyone else at this stage. I was planning to check in with the Steering Committee at the meeting on Friday to see if anyone else in that group wants to look at it.

Regards,

Claire Wimpenny

Senior Ecologist

Office of Nature Conservation | Environment, Heritage and Water Division | Environment, Planning and Sustainable Development Directorate (EPSDD) | ACT Government

Phone +61 2 6205 8252 | Email claire.wimpenny@act.gov.au

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From: [REDACTED]
Sent: Mon, 4 Mar 2024 17:21:10 +1100
To: Potapowicz, Pawel
Cc: Wimpenny, Claire
Subject: RE: kangaroo management and road collisions

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Sure is! I'll send a Teams invite?
S

From: Potapowicz, Pawel <Pawel.Potapowicz@act.gov.au>
Sent: Monday, March 4, 2024 5:20 PM
To: [REDACTED]
Cc: Wimpenny, Claire <Claire.Wimpenny@act.gov.au>
Subject: RE: kangaroo management and road collisions

OFFICIAL

Hi

Is tomorrow Tuesday 11AM ok?

Regards
Pawel

From: [REDACTED] >
Sent: Thursday, February 29, 2024 6:05 PM
To: Potapowicz, Pawel <Pawel.Potapowicz@act.gov.au>
Cc: Wimpenny, Claire <Claire.Wimpenny@act.gov.au>
Subject: RE: kangaroo management and road collisions

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Hi Pawel

I lost momentum here, apologies, I had other things on my plate for a while. But Im still keen to line up a chat with you to talk about mitigation for roo collisions.

Do you have time to meet online next week, eg:

- Anytime Tuesday before 2.30

- Anytime thurs before 1230
- Anytime Friday before 2.30.

30 mins might be enough, but lets schedule an hour, to be safe.,

Many thanks
Sarah

From: [REDACTED] >
Sent: Thursday, February 8, 2024 11:21 AM
To: 'Potapowicz, Pawel' <Pawel.Potapowicz@act.gov.au>
Cc: 'Wimpenny, Claire' <Claire.Wimpenny@act.gov.au>
Subject: RE: kangaroo management and road collisions

Argh, sorry, I cant do Fridays. I don't work on Fridays ([REDACTED]). Another day?
S

From: Potapowicz, Pawel <Pawel.Potapowicz@act.gov.au>
Sent: Thursday, February 8, 2024 11:04 AM
To: [REDACTED]
Cc: Wimpenny, Claire <Claire.Wimpenny@act.gov.au>
Subject: RE: kangaroo management and road collisions

OFFICIAL

Hi , Could we make this next week Friday 10AM?

From: [REDACTED]
Sent: Thursday, February 8, 2024 10:44 AM
To: Potapowicz, Pawel <Pawel.Potapowicz@act.gov.au>
Cc: Wimpenny, Claire <Claire.Wimpenny@act.gov.au>
Subject: RE: kangaroo management and road collisions

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Hi Pawel, sorry for the delay, I had fieldwork on this last week.

Could we catch up on Tuesday, say at 10 am? If not, please suggest a time that works for you.
Best regards
Sarah

From: Potapowicz, Pawel <Pawel.Potapowicz@act.gov.au>
Sent: Friday, February 2, 2024 2:27 PM
To: [REDACTED]

Cc: Wimpenny, Claire <Claire.Wimpenny@act.gov.au>

Subject: RE: kangaroo management and road collisions

OFFICIAL

Hi Sarah

Yes, happy to have a discussion on this topic.

Kind regards

Pawel

From: [REDACTED] >

Sent: Thursday, February 1, 2024 8:16 AM

To: Potapowicz, Pawel <Pawel.Potapowicz@act.gov.au>

Cc: Wimpenny, Claire <Claire.Wimpenny@act.gov.au>

Subject: kangaroo management and road collisions

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Hi Pawel

I hope this finds you well.

I've been engaged by the Conservator to carry out the statutory, independent review of the ACT Kangaroo Management Plan. As you will know, the plan is focussed on managing the environmental impacts of high density roo populations, but it also considers economic impacts, and social impacts (including from road collisions). The Plan has a specific objective to reduce the rate of kangaroo-vehicle collisions.

I'm wondering if you can share any information of what mitigation strategies (controlling speed limits, underpasses, fencing, etc) have been put in place; how the locations for these interventions are selected; and whether there is any monitoring of the outcomes of the interventions. Are there other bits of information that you think could be relevant for this review?

If its easier, we could set up a time to chat online?

Many thanks in advance

Sarah

Professor (Wildlife Conservation) Charles Darwin University
Honorary Professor, The Australian National University
Principal Research Fellow, University of Queensland

Biodiversity Councillor
Co-editor in chief, Wildlife Research



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