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Dear Eunjee

RESULTS OF YEAR 8 ANNUAL SOUTH MORANG GRASSY EUCALYPT WOODLAND MONITORING (SOUTH MORANG LOT 52)

Kellogg Brown & Root Pty Ltd (KBR) has been engaged by VicTrack to complete an annual condition assessment of the site known as the South Morang Grassy Eucalypt Woodland (SMGEW) located on Railway Lot 52. The annual monitoring of the vegetation condition and response to management is a requirement of the *South Morang Grassy Eucalypt Woodland Management Plan* (SMREP 2014), management action 6.2.

Purpose and objectives

Annual monitoring is required to assess the state of the vegetation community and any threats from weeds, biomass and pest animals (including kangaroos). A site inspection was conducted by two ecologists on 23 October 2018, to assess the above threats and the overall site condition.

The annual monitoring program is also required to identify any changes to the current management practices and to inform management over the subsequent year. Therefore, recommendations within this letter provide adaptive management solutions to the existing planned management detailed within the SMGEW Management Plan (SMREP 2017).

Mernda Rail Extension Project

A 0.82 ha section of the SMGEW was cleared for the Mernda Rail Extension Project (MREP). The project, delivered by the Level Crossing Removal Authority (LXRA), gained approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) via a new approval (EPBC 2016/7674).

An amendment to the existing approval for the South Morang Rail Extension Project (EPBC 2010/5313), which identified the 0.82 ha area of vegetation in the SMGEW as protected, was also required. Part of this approval process required the *South Morang Grassy Eucalypt Woodland Management Plan* (SMREP 2017) to be updated to reflect the changes to the site. This plan previously identified management for the entire 2 ha site, and needed to be updated to reflect the impact of the MREP along the northern boundary.

Current site condition

There was a notable reduction in biomass over the site and the cover of annual and perennial grassy weeds. A significant management effort has been completed on the site targeting the biomass and perennial high threat weeds.

A significant amount of the biomass has been removed through management, slashing and mowing and spraying, compared to previous years monitoring. The biomass targeted is predominately perennial exotic grasses, and combined with targeted weed control and herbicide treatment of species such as Chilean needle-grass (*Nassella neesiana*), has reduced the overall cover of these high threat weeds.

The result has been an apparent (although no plant number counts were completed) increase in the number of observed matted flax-lily plants on previous years. Several new plants were identified in areas where mowing and slashing had occurred. The observed apparent increase was based on the familiarity of the site to the assessor and not through any formal count. This observation was then supported by a check against known records included in the latest revision of the site management plan (SMGEW 2017).

The works have resulted in an increase in cover of native species. Notably there is an increase in cover of kangaroo grass (*Themeda triandra*). Management appears to have avoided impacts to native species and, as seen in Figure 1, kangaroo grass is now the dominant species in the treated areas. The site maintains a reasonable cover and diversity of other lilies, mainly chocolate lily (*Arthropodium strictum*) and milkmaids (*Burchardia umbellata*). There were fewer bulbine lily (*Bulbine bulbosa*) observed compared to previous years, however, this may be due to recent dry conditions (BoM 2018, BoM 2018a).

Biomass management had also targeted annual grasses, although recent rain may have triggered a fresh germination of species, as there appeared to be new growth of annual grasses in cleared areas.

Figure 1. Area of reduced biomass and treated grasses.

Grassy and herbaceous weeds

The cover of grassy and herbaceous weeds has dropped significantly following recent management. The overall cover of grassy and herbaceous weeds has decreased from 2017 levels of up to 60 per cent, to a current overall level of 40 per cent.

The majority of grassy and herbaceous weeds were annual grasses, such as soft brome (*Bromus hordeaceus*), great brome (*Bromus diandrus*), annual rye-grass (*Lolium rigidum*), squirrel-tail grass (*Vulpia bromoides*) and large quaking-grass (*Briza maxima*). These were often observed in the treated areas, likely increasing cover in response to recent rainfall.

Perennial grasses on site, such as cocksfoot (*Dactylis glomeratus*), Yorkshire fog (*Holcus lanatus*), Chilean needle-grass, Texas needle-grass (*Nassella leucotricha*) and phalaris (*Phalaris aquatica*), are considered the highest threat to the community and matted flax-lily, particularly at high cover. These species have been significantly reduced in cover over the site. The greatest concentration is in in the south east of the site, where there was high cover of phalaris and cocksfoot. Notably, management has been targeting Chilean needle-grass and Texas needle-grass, with these two high impact species at low levels.

Herbaceous weeds comprise the lowest cover of these weeds. Cover is at a similar level to 2017 of around 2 per cent (KBR 2017), with approximately 3 to 4 per cent cover presently. The majority of these species are low impact species, however, the high threat species, Paterson's curse (*Echium plantagineum*) was noted throughout the site, but this was generally only present as scattered individuals. These weeds are not an immediate threat and current management should be sufficient to control these species.

Figure 2. Area of treated (dead) Chilean needle-grass tussocks.

Woody weeds

The cover of woody weed species remains low (less than 1 per cent cover) with a few individual sweet briar (*Rosa rubiginosa*) observed across the site. Ongoing management of woody weeds should continue in order to maintain this low cover.

Biomass

As noted above, significant effort has been applied on the site to manage biomass, particularly of high threat perennial grasses. Hence, the biomass on site is significantly reduced from previous years. Currently, the level of biomass is not threatening the community and has appeared to have encouraged sprouting or germination of matted flax-lily and other lilies, such as milkmaids and chocolate lilies.

High biomass levels of exotic grasses are still present in the south eastern boundary of the site, although it is isolated to small areas.

Biomass can quickly develop, particularly with some rainfall, as noted by the increase in annuals, and should be continually managed. However, the effort completed on site recently will allow management to aim to maintain these levels and to target the high threat weeds.

Pest and Native Animals

Rabbit activity was observed in the site, which included digging of a potential warren, but this did not appear active or to be a complete warren. One breach was noted in the eastern boundary fence, where rabbits appear to be actively entering the site. Rabbits are likely to keep accessing the site while gaps are present. Rabbit activity and presence will need to be monitored following completion of repairs to make the fence rabbit-proof.

No kangaroo activity or activity by other animals and grazers was observed on the site. No damage was observed to the translocated matted flax-lilies, and no significant grazing or damage was observed within the SMGEW.

Figure 3. Breach in the eastern boundary fence used by rabbits.

Adjacent Land Use and Fence Condition

As noted in the previous report (KBR 2017), an area, between the newly constructed rail fence and the boundary of the approved impact area of the woodland, has been disturbed by the project and is potentially a weed source into the SMGEW.

Discussions with MREP indicate that the area will be re-seeded with a mix of indigenous grass species and maintained to prevent spread of weeds into the site. It is understood that this area will be incorporated into the overall SMGEW and under VicTrack management.

Rubbish is at very low levels throughout the site, with only incidental rubbish present along the McDonalds Road boundary, where passers-by have the opportunity to litter into the reserve. This is a minor management issue at present.

Existing Matted Flax-lily

Observations on the population of existing matted flax-lily within the site over the previous years noted that the amount of biomass was impacting the abundance of the species throughout the site (KBR 2017). With the extensive biomass management on the site recently, it was observed that the works had a positive impact on the species. Several additional matted flax-lily were observed within the site particularly where biomass management had occurred, see Figure 4.

The current management effort is likely to benefit the species for several seasons. Biomass control should continue to occur, though preference is to control biomass of high threat perennial grasses.

Figure 4. New matted flax-lily plant emerging following biomass removal.

Conclusions

The management effort applied to the site since the previous monitoring has increased the quality of the woodland community. The actions have also had a positive impact on the extant population of matted flax-lily, where the inter-tussock spaces that have been opened have allowed the species to emerge or germinate.

Management actions throughout the previous year has been significant in controlling the biomass and high threat grassy weeds that jeopardise the site meeting the criteria for the nationally listed community and persistence of matted flax-lily.

These actions will also allow contractors to target and more effectively control the abundance and spread of high threat perennial grass weeds. These species are considered to be the greatest threat to the sites values and should still be the primary management target.

Annual weeds are currently the greatest proportion of weed cover over the site. It is likely that recent rainfall has resulted in a germination event across the site, where biomass management has also opened space to germinate into. Extensive areas could be targeted for physical removal of weed seed when seeding; which was a management action completed in initial management years. Also, where biomass control for fuel management contains a good supply of native seed, this may be retained on site and spread over areas that contained high densities of weeds.

Recommendations

From the above conclusions the following recommendations are made to maintain effective site management:

- Continue targeting high threat weed species to assist in maintaining low biomass, particularly the high threat perennial grasses; Chilean needle-grass, Texas needle-grass, cocksfoot and phalaris. This is applicable to Management Action 6.1;
- Consider use of mow-and-catch for high density areas of high threat perennial grasses to remove weed seed, as applicable to Management Action 6.4;
- Maintain low cover of woody weeds with the aim to eliminate from site. This is applicable to Management Action 6.1;
- Include annual grasses for priority weed control from August to October. In particular, Bromes (*Bromus* spp.), sweet vernal grass and large quaking-grass. These should be targeted with a combination of mow-and-catch of flowering or early stages of seed development and appropriate herbicide spraying. This is applicable to Management Actions 6.1 and 6.4;
- The breach in the eastern boundary should be repaired as soon as practical and made rabbit-proof. Following repairs, inspect the site for evidence of rabbits and conduct a control program to eradicate any resident individuals.

It is considered that these actions are generally consistent with the current management plan and that no significant change or alteration to the defined management actions (SMREP 2017) are required.

If you have any queries regarding the above please contact me at adam.rigg@kbr.com or on (03) 9828 5421.

Yours sincerely,

Adam Rigg
Senior Ecologist

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