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Dear Madelyn

RESULTS OF YEAR 6 ANNUAL SOUTH MORANG GRASSY EUCALYPT WOODLAND MONITORING

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). 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 20 October 2016, 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 2014).

General site condition

There was a clear increase in the cover of annual grassy weeds on site, which currently dominate the site. This is likely due to the wet conditions that have occurred in Victoria from June to October. There was very high cover of species, including soft brome (*Bromus hordeaceus*), great brome (*Bromus diandrus*), annual rye-grass (*Lolium rigidum*), squirrel-tail grass (*Vulpia bromoides*), large quaking-grass (*Briza maxima*) and lesser quaking-grass (*Briza minor*), provided the greatest cover of all understorey on site.

In addition to this was a high cover of perennial grasses, including cocksfoot (*Dactylis glomeratus*), Yorkshire fog (*Holcus lanatus*), sweet vernal grass (*Anthoxathum odoratum*), Chilean needle-grass (*Nassella neesiana*) and phalaris (*Phalaris aquatica*). These species tended to occur in clumps.

The wet conditions experienced in Melbourne also provided suitable conditions for native species; with a high abundance of native annuals and graminoids present. Species, mainly chocolate lily (*Arthropodium strictum*), milkmaids (*Burchardia umbellata*), tufted bluebell (*Whalenbergia communis*) and bulbine lily (*Bulbine bulbosa*), were present in high concentrations throughout most of the site.

Kangaroo grass (*Themeda triandra*) remains the dominant native grass species and was present in reasonably high densities, considering there was little evidence of current growth (the species is a summer growing grass). The cover of wallaby grass (*Rytidosperma* spp.) is low, a result of previous selective grazing from kangaroos and high cover of annual grasses.

The matted flax-lily in Site 4 (translocation site) is in good condition with low cover of weeds and biomass and sufficient inter-tussock spacing. Kidney weed (*Dichondra repens*), a small native rhizomatous groundcover has increased in cover throughout the site and appears to be suppressing weeds; although growing well amongst translocated matted flax-lily (see Figure 1).

Figure 1. A healthy translocated matted flax-lily surrounded by the native groundcover, kidney weed

Grassy and herbaceous weeds

The cover of grassy and herbaceous weeds has increased substantially since last monitoring. These species remain a high priority for management, particularly for the current season, as there is likely to be a high amount of viable seed produced, responding to rain and good growing conditions (Figure 2).

These species pose the biggest threat to the suppression of native species and the overall condition of the site. Of note, wallaby-grasses, which once dominated the site, appear to be reducing in cover. Wallaby-grasses are now being replaced by exotic perennial and annual grasses. Kangaroo grass is also increasing in cover, this is considered to be due to the species being a summer grass, where there is less immediate competition from annual grasses, which have completed their life cycle during the kangaroo grass growth and flowering stages.

Figure 2. High levels of the annual exotic grass, large quaking-grass, Briza maxima, in an area with usually high native grass and herb cover

The cover of target perennial grasses, mainly Chilean needle-grass, phalaris and cocksfoot remains comparatively low, however both species increased in cover since the last monitoring period. Chilean needle-grass also appears to have spread across the site, with several small patches of the species observed. Paterson's curse has also appeared to have increased in cover; though still low in overall cover, it is considered to be at greatest levels in several years.

The overall cover of grassy and herbaceous weeds is approximately 55 to 60 per cent, comprised of a significant increase in the cover of annual grasses (45 per cent cover), and smaller increases of perennial grasses (10 per cent cover) and herbaceous weeds (2 per cent cover).

It is recommended that management days are concentrated or increased during this current season to respond to optimal growing conditions. VicTrack may consider including an additional weed control days during October and November to target the high amount of seed being produced by grassy and herbaceous weeds. Weed control should be conducted in conjunction with biomass control, which will generally target larger patches of exotic grasses, see below.

Woody weeds

The cover of woody weed species remains low, although there is an apparent increase particularly along the northern boundary. This is comprised of blackberry (*Rubus fruticosus spp. agg.*), hawthorn (*Crataegus monogyna*) and sweet briar (*Rosa rubiginosa*). Ongoing management of woody weeds should continue in order to maintain this low cover.

Biomass

As opposed to previous years, where weather conditions and management have helped keep biomass low, the previous wet and mild conditions experienced over the last four months (BoM 2016) have resulted in a significant increase in the amount of biomass on site, in particular biomass of annual grasses. Although the annual grasses will die-back over the next month or two, there is likely to be a significant increase in the amount of dead grass material on site.

This season is likely to result in significant amount of viable seed being produced by grass species. This is likely to further increase the competition with native species during the following seasons. Although no changes in management are proposed, VicTrack should consider increasing or concentrating management days to effectively manage threats during this optimal growing season.

Increased effort of mow-and-catch could occur through October and November to target thick patches of annual and perennial grassy weeds, in particular, those seeding to prevent weed seed from entering the seed bank. This could extend into November and December to target perennial grass weeds.

Pest and Native Animals

No evidence of rabbits was noted within the site. Rabbit activity should be continued to be monitored and any rabbits remaining within the site should be controlled.

A small pod of kangaroos was observed in the site during the site inspection. Additionally, kangaroo scats were also observed in the fenced Receptor Site for translocated matted flax-lily, although there was no damage to the translocated plants. The kangaroos do not appear to be grazing any of the matted flax-lily plants and are generally not considered to be a threat to the ecological values on site, particularly as they only occur at low densities.

Adjacent Land Use and Fence Condition

Threats from adjacent land use has generally been a minor issue, however since the completion of the project, there appears to have been an increased level of vandalism to the perimeter fence. Discussions with VicTrack and the bushland manager, Abzeco, indicated that following the significant damage to the fence and intrusion by motorbikes and subsequent erection of a larger fence, no further intrusion has occurred and minimal vandalism or damage is visible.

Figure 3. New fence section, installed over past vandal access point

Rubbish is at very low levels throughout the site, with almost no rubbish present. Along the car park side of the site, there is rubbish piled up on the outside of the site.

Existing Matted Flax-lily

The high levels of biomass on site are considered to pose a risk to the immediate presence of matted flax-lily. Although the amount of biomass is predominately associated with annual grasses, which flower and set seed and senesce earlier than matted flax-lily; the build-up of biomass (including dead material following senescence) is likely to negatively affect matted flax-lily. Significant seed set is also likely with this season's growing conditions, which is likely to provide significant future competition with existing matted flax-lily.

Observations from the annual monitoring of the translocated matted flax-lily indicate that crowding by annual grasses, particularly those species that display an allelopathic effect, is likely to affect the persistence and health of the matted flax-lily.

The management of biomass is considered a key management action for the ongoing health of the woodland and the persistence of matted flax-lily. It is recommended that increased management days are provided for to implemented required actions in response to the high weed and biomass experienced on site. The management should aim to reduce current levels of biomass and to minimise the amount of weed seed entering into the seed bank.

Conclusions and Recommendation

The high levels of biomass and weed cover observed on site is in response to optimal growing conditions experienced in Melbourne and Victoria through winter and the start of spring 2016. Victoria experienced above average rainfall and mild temperatures during winter (BoM 2016) and was the second wettest September on record. Nearby Bundoora recorded 175 % of the average September monthly rainfall (BoM 2016).

It is therefore considered important for management to adapt and respond to these optimal weather conditions. It is recommended VicTrack increases or concentrates budgeted days spent by bushland managers to complete actions associated with weed control and biomass control to this current season to both control the current state of biomass and to minimise the amount of seed that matures and enters the seed bank.

The following recommendations are made in response to the annual monitoring:

- Management should target removal of significant weed species, including the observed patches of Chilean needle-grass and Paterson's curse, as a priority
- Other species to target for removal include any regenerating woody weeds, including blackberry, briar rose and hawthorn, where observed
- Additional management days should target the removal of overall exotic grass seed, including of perennial grasses, including cocksfoot and phalaris, and annual grasses, including large quaking-grass, great brome and soft brome
- Consideration should be given by VicTrack and the bushland manager in the use of contact or 'knock down' herbicides, as normal transport herbicides may not work in sufficient time to kill or damage the seeds
- Additional management days to control biomass through mow-and-catch should also be employed on larger concentrations or patches of grassy weeds in flower or are seeding. Weed seed should be removed from site.

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

References

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