SUPPLEMENTARY BOTANICAL IMPACT ASSESSMENT FOR THE
PROPOSED 3HA AREA OF CULTIVATION
ON DEETLEFS ESTATE, RAWSONVILLE


Applicant: Deetlefs Family Trust

Compiled by: Johlene Krige
Botanical Ecological Specialist
Boland Enviro cc, Worcester

30 March 2010

Consultants: Boland Environmental Consultants CC
PO Box 250, Worcester, 6849
Tel / Fax 023 347 0336
work@BolandEnviro.co.za

© BolandEnviro CC 2010 All rights reserved
INTRODUCTION
This botanical basic assessment was commissioned as a supplement to the botanical assessment conducted by Nick Helme Botanical Surveys on the 16th June 2009 in order to help inform decisions regarding the initially proposed development of up to 9ha of new agricultural land on Deetlefs Estate, in the Rawsonville area. This supplementary botanical assessment was conducted to accommodate the development of an additional area of up to 3ha of new agricultural land (establishment of vineyards). This site is located between the Smalblaar river and natural vegetation on the foothills of the Dutoits Mountain.

1. TERMS OF REFERENCE
Standard CapeNature and Botanical Society of South Africa Terms of Reference for biodiversity assessments were used as a basis for this report:

- Produce a baseline analysis of the botanical attributes of the property as a whole.
- This report should clearly indicate any constraints that would need to be taken into account in considering the development proposals further.
- The baseline report must include a map of the identified sensitive areas as well as indications of important constraints on the property. It must also:
  - Describe the broad ecological characteristics of the site and its surrounds in terms of any mapped spatial components of ecological processes and/or patchiness, patch size, relative isolation of patches, connectivity, corridors, disturbance regimes, ecotones, buffering, viability, etc.
  - In terms of biodiversity pattern, identify or describe:
    - **Community and ecosystem level**
      a. The main vegetation type, its aerial extent and interaction with neighbouring types, soils or topography;
      b. The types of plant communities that occur in the vicinity of the site
      c. Threatened or vulnerable ecosystems (*cf. SA vegetation map/National Spatial Biodiversity Assessment*)
    - **Species level**
      a. Red Data Book (RDB) species (provide location if possible)
b. The viability of and estimated population size of the RDB species that are present (include the degree of confidence in prediction based on availability of information and specialist knowledge, i.e. High=70-100% confident, Medium 40-70% confident, low 0-40% confident)

c. The likelihood of other RDB species, or species of conservation concern, occurring in the vicinity (include degree of confidence).

**Other pattern issues**

b. Any significant landscape features or rare or important vegetation associations such as seasonal wetlands, alluvium, seeps, quartz patches or salt marshes in the vicinity.

c. The extent of alien plant cover of the site, and whether the infestation is the result of prior soil disturbance such as ploughing or quarrying (alien cover resulting from disturbance is generally more difficult to restore than infestation of undisturbed sites).

d. The condition of the site in terms of current or previous land uses.

- In terms of **biodiversity process**, identify or describe:
  
a. The key ecological “drivers” of ecosystems on the site and in the vicinity, such as fire.

b. Any mapped spatial component of an ecological process that may occur at the site or in its vicinity (i.e. **corridors** such as watercourses, upland-lowland gradients, migration routes, coastal linkages or inland-trending dunes, and **vegetation boundaries** such as edaphic interfaces, upland-lowland interfaces or biome boundaries)

c. Any possible changes in key processes, e.g. increased fire frequency or drainage/artificial recharge of aquatic systems.

- What is the significance of the potential impact of the proposed project – with and without mitigation – on biodiversity pattern and process at the site, landscape, and regional scales?

- Provide a map, at suitable scale, of key conservation areas and corridors.

- Recommend actions that should be taken to prevent or mitigate impacts. Indicate how these should be scheduled to ensure long-term protection, management and restoration of affected ecosystems and biodiversity.

- Indicate limitations and assumptions, particularly in relation to seasonality.
2. LIMITATIONS AND ASSUMPTIONS

The site visit was undertaken on 3 March 2010. As this is at the end of the summer/dry season there were seasonal constraints on the botanical findings. No bulbs and very few natural vegetation were present at this time. The absence of natural vegetation appeared to be mostly due to the extremely dense cover of aliens which comprise the 3ha extent of the proposed site. This dense alien vegetation cover, including the remaining dead branches of previously chopped down trees, also put a large physical constraint in surveying the whole area. Given the size and context of the site, including the severity of alien infestation, these constraints are considered to be relatively unimportant.

4. METHODOLOGY

The Farm Deetlefs Estate was visited on the 3rd of March 2010. After obtaining an overview of the property from one of the managers, a focused survey was conducted on foot. Site photographs were taken and the site surveyed for habitat quality and presence of rare species, whilst recording all evident plant species.
Figure 1: Aerial view of the study area showing the initially considered 9ha site and the additional 3ha (this study) considered for cultivation. Google Image dated 22 November 2006.

5. THE VEGETATION

5.1 Regional Context

For details on the regional context of the surrounding area and more specifically the initially proposed 9ha site, refer to the botanical assessment conducted by Nick Helme Botanical Surveys (16th June 2009).

The original natural vegetation of the additional proposed 3ha site considered for cultivation, which is now severely infested with alien vegetation, is classified as Hawequas Sandstone Fynbos (Mucina & Rutherford 2006). A large, continuous natural area of this vegetation type, which is in good condition, is bordering the proposed site to the south and east (Dutoits Mountains). Approximately 30ha of this mountainous vegetation is located on the property of Deetlefs Estate and will remain untransformed. The site is bordered by the Smalblaar River to the north-west, separating it from an area previously covered by Breede Alluvium Fynbos but now comprising extensive vineyard development (Figure 1).
Hawequas Sandstone Fynbos, including the proposed 3ha site, is considered Least Threatened by the South African National Biodiversity Institute - Western Cape Ecosystem Status. The vegetation in this area has been identified more recently, at a finer scale as Brandvlei Waboomveld (C.A.P.E. Fine-Scale Biodiversity Planning (FSP) project).

It is clear from Figures 1 and 2 that the proposed 3 ha site is on the periphery of a natural area of Hawequas Sandstone Fynbos. The limited natural vegetation remaining along the Smalblaar River is severely disturbed by alien vegetation, spreading through the Smalblaar river channel.

Figure 2: Annotated extract from the South African Vegetation Map (Mucina & Rutherford 2006) indicating the vegetation types of the area and the location of the Smalblaar River running through the property. The locations of both the 3ha and initial 9ha sites are included.
Figure 3: Extract from the Fine Scale Plan 2009: Breede River / Winelands Municipality Critical Biodiversity Areas Map showing critical biodiversity areas (cba), other ecological support areas (oesa), no natural remaining areas and untransformed areas. The location of the proposed sites for agricultural development are also shown.

Figure 3 represent aquatic and terrestrial sites identified as Critical Biodiversity Areas (CBAs) through the systematic assessment conducted by the C.A.P.E. Fine-Scale Biodiversity Planning (FSP) project. These are areas of critical biodiversity value and represent the sites required to meet biodiversity pattern targets and ecological process objectives. It is recommended that natural land should be maintained and degraded areas rehabilitated. It is clear from Figure 3 that the proposed 3 ha site is located within an aquatic CBA. The aquatic ecosystem type is recognised as a valley bottom wetland. For details regarding the initial 9ha site, refer to the botanical assessment conducted by Nick Helme Botanical Surveys (16th June 2009).

5.2 Overview of the vegetation on site

As for the initially proposed 9ha site, the 3 ha site which have been under dense cover of Acacia mearnsii (black wattle) for at least ten years, was cleared of woody alien invasives in 2006 by a Working for Water team. Unfortunately the chopped branches and trees were not
removed, with the result that a large portion of the current ground cover consists of dense stacks of cut wood. More noticeably is the extensive re-infestation of the site with *Acacia mearnsii* over the past 4 years.

The disturbed nature of the site is evident in the extremely low natural species diversity. The site is dominated by the invasive *Acacia mearnsii* with a lower stratum of dead branches, grasses and scatters of a limited number of natural species.

The following indigenous terrestrial species were noted within the proposed 3 ha area considered for cultivation:

Shrubs: *Dodonaea angustifolia* (Ysterhout, Koorsboom), *Athanasia trifurcata* (Kouterbos), *Helichrysum crispum* (Kooigoed), *Oftia Africana*, *Stoebe plumose* (Slangbos), *Senecio pinifolius*, *Othonna parviflora* (Bobbejaankool); Annual herbs: *Senecio* sp., *Oncosiphon grandiflorum*, *Helichrysum* sp.; Grasses: *Ehrhartha calycina*, *Eragrostis curvula* (lovegrass); Restios: *Ischyrolepis capensis*, *Cannomois virgin*.

Indigenous species typical in the riparian zone, located between the area intended for cultivation and the river bank, include *Virgilia oroboides* (keurboom), *Brabejum stellatifolium* (wild almond) *Calopsis paniculata*, and *Prionium serratum* (palmiet). *Prionium serratum* were abundant on the south-eastern bank of the river. It is recommended that these plants which play a critical role in stabilising riverbanks, be left in tact and not being disturbed in any way.

Apart from the invasive *Acacia mearnsii*, invasive grasses such as *Briza maxima* (quaking grass), *Lolium* sp. (ryegrass), *Avena* sp (wild oats) and *Polypogon monspeliensis* were common. Herbs such as *Taraxacum* (dandelion), and shrubs such as *Ricinis communis* (castor oil) and *Rubus* sp. (bramble). A few young pine trees (*Pinus* sp) were also noted.

No rare or localised plant species were recorded in the study area, and the likelihood of such species persisting in viable numbers is considered to be low.

5.3 Conservation Value

From a purely botanical perspective the site has a Low – Medium local (Rawsonville) and Low regional (Upper Breede River Valley) conservation value. The site is small, disturbed, with a low indigenous species diversity and no rare species. The site, however falls within an aquatic CBA, which forms part of the Smalblaar river wetland (fynbos valley bottom).
Despite the proposed 3ha site being located within a CBA, the original vegetation (Hawequas Sandstone Fynbos) is considered least threatened. The proposed site is extremely degraded and severely infested with alien vegetation (already transformed). It is unlikely that the proposed 3 ha site would act as an important corridor area being left in its current state. This site however, poses a threat to remaining natural vegetation rather than adding to biodiversity value. Given that the riparian zone of the site is being preserved, cultivation of the proposed site would entail the removal of alien vegetation, mitigating the threat that the site currently poses to the adjacent and down-stream vegetation. The remainder of the Hawequas Sandstone Fynbos, which falls outside the area to be developed, is of high quality and due to the steepness of the slope it is unlikely to ever be developed in future.
Figure 4: View downstream showing *Prionium serratum* (plamiet) on the south-eastern bank of the Smaalblaar river, the alien infested area considered for cultivation and natural Hawequas Sandstone Fynbos in the background.

Figure 5: View looking towards the area considered for cultivation and the adjacent natural Hawequas Sandstone Fynbos.

Figure 6: Dense stands of *Acacia mearnsii* (black wattle), remnants of previously cleared alien trees, dense grass cover and scatters of fynbos elements (*Athanasia trifurcate* in foreground and the restio *Cannomois virgata* further back).

Figure 7: Extremely dense alien vegetation cover including dense stacks of cut wood put a physical constraint on sampling the area.
**Figure 8:** Upper boundary of the proposed site looking towards adjacent natural Hawequas Sandstone Fynbos. *Acacia mearnsii* is gradually spreading towards the natural areas.

**Figure 9:** Upper boundary of the proposed site looking downwards from the adjacent natural Hawequas Sandstone Fynbos towards the alien infested area.
6. IDENTIFICATION OF ISSUES AND IMPACTS

The development of a vineyard on the proposed 3ha site will cause permanent loss of the vegetation and natural habitat in the area.

6.1 Direct Impacts

Potential direct impacts identified are:

- Loss of indigenous plant species
- Removal of invasive plant species
- Loss of vegetation type
- Loss of habitat

6.1.1 Loss of indigenous plant species

Natural species diversity on the site is extremely low and no rare or endangered species were encountered during the survey. The site is bordered by an extensive area of natural vegetation in good condition and the development will be confined to the small site located within the alien invested area (approximately 3ha).

Table 1. Impact: loss of indigenous plant species

<table>
<thead>
<tr>
<th>Nature</th>
<th>Extent</th>
<th>Duration</th>
<th>Intensity</th>
<th>Probability</th>
<th>Status</th>
<th>Confidence</th>
<th>Significance Without mitigation</th>
<th>Significance With mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of indigenous plant species</td>
<td>Site</td>
<td>Long term</td>
<td>Medium</td>
<td>Definite</td>
<td>Negative</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
</tbody>
</table>

Mitigation

- Possible mitigation would be to ensure that the development is limited to the upper/terrestrial alien infested area. A minimum of 32 m buffer (suggested by DWAF guidelines for riverine buffers) should be maintained between the bank of the Smalblaar river and the edge of new development.
- Natural riparian vegetation on the bank of the Smalblaar river should be left in tact.

6.1.2 Removal of invasive plant species

The proposed development of vineyards on the proposed site would entail the removal of all alien invasive species within the development footprint, especially the dominant *Acacia mearnsii* that poses a threat to adjacent and downstream natural vegetation.
### Table 2. Impact: removal of invasive plant species

<table>
<thead>
<tr>
<th>Nature</th>
<th>Extent</th>
<th>Duration</th>
<th>Intensity</th>
<th>Probability</th>
<th>Status</th>
<th>Confidence</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removal of invasive species</td>
<td>Site</td>
<td>Long term</td>
<td>Medium</td>
<td>Definite</td>
<td>Positive</td>
<td>High</td>
<td>Low</td>
</tr>
</tbody>
</table>

Mitigation

- Mitigation would be to ensure that all the *Acacia mearnsii* (black wattle) are being removed.
- The development should be restricted to the upper-terrestrial area but all the black wattle including both the riparian and those integrating with the adjacent natural Hawequas Sandstone Fynbos should be removed.
- This removal should be followed up to prevent re-infestation of the river corridor and adjacent vegetation.
- The wood cuttings should be disposed of the site without removing/transforming additional natural vegetation or disturbing the river.

### 6.1.3 Loss of vegetation type: Hawequas Sandstone Fynbos

Hawequas Sandstone Fynbos is found over an extensive area in the DuToits, Slanghoek and Brandvlei Mountains. It also occurs extensively on the Farm Deetlefs Estate with approximately 30ha untransformed vegetation on the property. This localised loss of vegetation type due to the proposed development of additional vineyards on Deetlefs Estate will have a very small overall effect and will in no other way endanger the future of this vegetation type.

### Table 3. Impact: loss of Hawequas Sandstone Fynbos

<table>
<thead>
<tr>
<th>Nature</th>
<th>Extent</th>
<th>Duration</th>
<th>Intensity</th>
<th>Probability</th>
<th>Status</th>
<th>Confidence</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of vegetation type</td>
<td>Local</td>
<td>Long term</td>
<td>High</td>
<td>Definite</td>
<td>Negative</td>
<td>High</td>
<td>Low</td>
</tr>
</tbody>
</table>
Mitigation

- The spread of alien plant species into the adjacent natural vegetation should be prevented by removing all alien species on and around the proposed site and to follow up on this control.
- Activities associated with the agricultural development should be done in a sensitive fashion to limit the disturbance to as small a footprint as possible.

6.1.4 Loss of habitat

The cultivation of and development of the proposed 3ha site will lead to a small amount of loss of the habitat but it will be localised and fauna and other organisms that use those areas will have other similar habitat still available to them. The effect of the loss will therefore be limited. However, it is vital that the proposed fields do not encroach into or transform the riparian zone of the Smalblaar river.

<table>
<thead>
<tr>
<th>Nature</th>
<th>Extent</th>
<th>Duration</th>
<th>Intensity</th>
<th>Probability</th>
<th>Status</th>
<th>Confidence</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of habitat</td>
<td>Site</td>
<td>Long term</td>
<td>Medium-high</td>
<td>High</td>
<td>Negative</td>
<td>High</td>
<td>Medium</td>
</tr>
</tbody>
</table>

Mitigation

- A 32m buffer strip between the development and the river should be maintained.
- Access to the new development and all infrastructure should be in a sensitive fashion as to prevent habitat loss or transformation within the riparian zone.
- The stands of *Prionium serratum* (palmiet) should not be disturbed in any way as these plants play an essential role in stabilising the river bank.

6.2 Indirect impacts

Indirect impacts are associated with the operational phase and would act on the remaining natural vegetation (within the 32m buffer area and adjacent natural fynbos), and also at a regional scale (ecological connectivity).

6.2.1 Loss of ecological processes
Despite the loss of a localised area of fynbos at Deetlefs Estate, it is unlikely that this will have a significant direct effect on ecological processes such as pollination in the remaining fynbos. Ecological processes will still be able to take place over extensive areas.

As for fire, it will not be desirable to have fire in the vicinity of cultivated fields. However, it would be necessary to ensure that the surrounding natural vegetation would still be subject to a natural fire regime.

**Table 5. Impact: loss of ecological processes**

<table>
<thead>
<tr>
<th>Nature</th>
<th>Extent</th>
<th>Duration</th>
<th>Intensity</th>
<th>Probability</th>
<th>Status</th>
<th>Confidence</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of ecological processes</td>
<td>Site</td>
<td>Long term</td>
<td>Medium</td>
<td>High</td>
<td>Negative</td>
<td>High</td>
<td>Medium</td>
</tr>
</tbody>
</table>

**Mitigation**
- Wide-scale ecological processes such as those driven by fire must be permitted to continue on adjacent natural fynbos.
- Suitable fire-breaks should be made around the agricultural fields to ensure that as far as possible the natural fire-regime in the fynbos that is not cultivated is allowed.

**6.2.2 Disturbance of Smalblaar river CBA**

The proposed site is located within a CBA classified as a valley bottom wetland. Although the area intended for cultivation is heavily degraded, the development will entail access to the site over the Smalblaar river, and would result in the permanent transformation within the cultivated area. Transformation within this CBA could have a negative impact on the ecological connectivity along the Smalblaar river.

**Table 6. Impact: loss of ecological connectivity**

<table>
<thead>
<tr>
<th>Nature</th>
<th>Extent</th>
<th>Duration</th>
<th>Intensity</th>
<th>Probability</th>
<th>Status</th>
<th>Confidence</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of ecological connectivity</td>
<td>Regional</td>
<td>Long term</td>
<td>High</td>
<td>Probable to definite</td>
<td>Negative</td>
<td>High</td>
<td>Medium</td>
</tr>
</tbody>
</table>

**Mitigation**
• The 32m wide buffer area should remain in tact. This includes natural riparian vegetation encountered during the survey.
• The agricultural development should be as far as possible from the Smalblaar river and restricted to the buffer zone of the CBA and the area outside the CBA.
• Disturbance within the CBA such as infrastructure and access roads should be prevented as far as possible.
• Ongoing, annual alien clearing within the CBA area must be undertaken, using DWAF approved methodology. All visible alien plants should be removed annually.
• No herbicide spraying should take place within the natural riparian zone.

6.3 Cumulative Impacts
Cumulative impacts of the proposed agricultural development of the proposed 3ha site on the Farm Deetlefs Estate will result in a small loss of Hawequas Sandstone Fynbos and the habitat it provides. Since this vegetation type is widespread and least threatened and the proposed site already disturbed, the cumulative effect of this loss on a regional and national scale is negligible.

Transformation within a recognised CBA may have the cumulative effect of not meeting biodiversity pattern targets and ecological process within valley bottom wetlands. The only mitigation for this loss of connectivity along the Smalblaar river is the removal of alien vegetation which will result from the development, the already transformed nature of the proposed site intended for cultivation and to prevent any development within the 32m riparian zone.

6.4 The No Go Alternative
The No Go alternative, where no agricultural development will occur on the proposed site, would have low direct negative impacts on the vegetation and the ecological connectivity will remain as it currently is. This alternative, however would result in the ongoing negative impact of alien plant invasion. The spread of alien species into untransformed areas is already evident on site. Without strategic rehabilitation, this alternative is not preferred in the context of this site.
7. CONCLUSIONS

- The proposed development would have a Medium negative botanical impact (local scale) prior to mitigation (not recommended in this form). Essential mitigation measures are outlined which should reduce the overall post mitigation impacts to a Low negative level.

- The most important mitigation measures include the ongoing removal of alien species and prevention of any disturbance, where possible, within the 32m buffer zone (especially the disturbance of the river bank to access the site) or to limit disturbance to the smallest footprint possible and as far as possible from the Smalblaar river.

- The No Go alternative may have some indirect negative impacts with no guarantee of future site improvement (alien clearing, rehabilitation, etc.).

- It is suggested that the application be authorised, but with the strict conditions that the development is limited to above the 32m buffer comprising the alien infested area or further up and that all natural vegetation between the development and the Smalblaar river be preserved to function as a corridor within the recognised CBA.

8. REFERENCES


