NICK HELME BOTANICAL SURVEYS
PO Box 22652 Scarborough 7975
Ph: 021 780 1420 Fax: 021 780 1868 cell: 082 82 38350 email: botaneek@iafrica.com
VAT Reg. # 4930216892
Pri.Sci.Nat # 400045/08

BOTANICAL SENSITIVITY STUDY OF PORTION 4 OF

FARM 560, YZERFONTEIN.

Compiled for: De Villiers Family

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1. INTRODUCTION

This specialist botanical study was commissioned to help inform decisions regarding the botanical constraints on Portion 4 of Farm 560, just outside Yzerfontein. The approximately 760ha study area lies east and southeast of Yzerfontein, south of the main road into the town, and east of the Pearl Bay coastal development.

2. LIMITATIONS, ASSUMPTIONS AND METHODOLOGY

One of the important limitations is in regards to mapping. Firstly, it is not possible to be 100% accurate when mapping off aerial imagery and ground truthing, as it can be difficult to georeference certain points. Secondly, some of the boundaries (between vegetation types, and between areas of different conservation value) are not always clear cut and indisputable, and some of the final lines on the maps are thus subject to interpretation, and cannot be considered 100% definitive and "the final word". Some of the lines are thus "best guesses", but generally the mapping provides a useful gauge of overall and relative sensitivity. It should be noted that the word "sensitivity", although commonly used, is perhaps a little misleading, as all natural vegetation is essentially sensitive to disturbance, in that heavy disturbance will eliminate most of the vegetation. "Conservation value" is perhaps a more accurate term, and is preferentially used in this report, other than in the title.

The site was visited on 22 July 2008, and again on 20 August, and a fairly accurate picture of the vegetation patterns and species was obtained as this is within the winter – spring flowering period. However, it is not possible to record all rare species during a single or even in multiple site visits, as it is a large site, and not all areas were examined in detail. Furthermore, many bulb and annual species are only identifiable when in flower, which may be for less than three weeks a year, and this may not coincide with the site visits. One therefore uses an element of the habitat approach, wherein habitat quality, rarity and diversity is used to help inform the overall assessment of conservation value, in addition to the more species based approach.

Most of the site boundaries were driven, and frequent walks were taken into interesting or representative habitats. I also walked around the high point of the site (marked by the Vodacom mast and water reservoirs), and in parts of the adjacent properties, and noted all species of conservation concern, plus their abundance and distribution. Vegetation patterns were mapped by means of a combination of

groundtruthing, reference to aerial imagery, and observation with binoculars from the top of the main hill.

3. TERMS OF REFERENCE

The terms of reference for this study were as follows:

- Produce a botanical constraints map of the site that could be taken into account when planning any future developments.

The general information that has informed this study is based partly on the Terms of Reference suggested for biodiversity specialists by the Botanical Society of South Africa and CapeNature.

4. REGIONAL CONTEXT OF THE VEGETATION

The study site lies firmly within the Fynbos biome and the Cape Floristic Region (CFR). The CFR is one of only six floristic regions in the world, and is the only one confined to a single country. It is also by far the smallest floristic region, occupying only 0.01% of the world's land surface, and supporting about 9000 plant species - almost half of all the plant species in South Africa. At least 70% of all the species in the Cape region do not occur elsewhere, and many have very small home ranges (these are known as narrow endemics). Most of the lowland habitats are under pressure from agriculture, urbanisation and alien plants, and thus many of the range restricted species are also under severe threat of extinction, as habitat is reduced to extremely small fragments. The latest data from the Red Data Book listing process currently being undertaken for South Africa is that fully 85% of the threatened plant species in the country occur only in the southwestern Cape, and these total over 1700 species (D. Raimondo – pers. comm.)! It should thus be abundantly clear that the southwestern Cape is a major national and global conservation priority, and is quite unlike anywhere else in the country in terms of the number of threatened plant species. Developments in this area thus need to take this into account.

To a certain extent the Yzerfontein area can be regarded as a southern outlier of the Langebaan and Saldanha area, this affinity being based on similar vegetation types and similar plant species. The Langebaan / Saldanha / Vredenburg Peninsula has experienced very rapid urban development in the last ten years, placing great pressure on the remaining natural vegetation in the area, which is known to be rich in both endemic (species restricted to the area) and threatened plant species. For these reasons the CAPE (Cape Action for People and the Environment) project identified the Saldanha region as a priority for Fine Scale Conservation Planning (FSP), and the FSP for this area was undertaken in 2006 and 2007. The vegetation report has

been completed (Helme & Koopman 2007), although it should be noted that the Fine Scale Vegetation Mapping did not extend south of the West Coast National Park, and thus excluded the current study area. This has implications for the subsequent conservation plan (FSP), which has been reviewed by key roleplayers and is essentially now in press (Pence – in press). The FSP identifies Critical Biodiversity Areas (CBAs), which are areas known to support range restricted Red Data Book listed plant species and threatened habitat, and also areas that form parts of important ecological corridors. However, because detailed vegetation mapping of the Yzerfontein area was not undertaken the FSP had to use the SA Vegetation Map (Mucina & Rutherford 2006) as a base, which as I will show is inaccurate in this area, and thus the resultant Fine Scale Plan unfortunately cannot be considered really accurate or useful in this area.

5. THE VEGETATION ON SITE

Moving from west to east the natural vegetation on site has been classified as Langebaan Dune Strandveld, Saldanha Flats Strandveld and Hopefield Sand Fynbos (Mucina & Rutherford 2006). The former is mapped as occurring primarily west of the site, and barely occurs on the site. However, the SA Vegetation Map, because it was not based on groundtruthing, has missed out on two important vegetation types which do occur on the site – Saldanha Limestone Strandveld and Saldanha Granite Strandveld. The former is restricted to exposed limestones (calcretes) or areas with significant limestone in the soil, and the latter is restricted to areas with granitic (dioritic) soils.

It is often difficult to distinguish between some forms of Saldanha Limestone Strandveld and forms of Langebaan Dune Strandveld, especially where these occur on poorly developed or exposed calcretes, with significant overlying sand (see also Helme & Koopman 2007). This is exactly what happens on large parts of this site west and southwest of the main hill, and the vegetation consequently has elements of both vegetation types, and classification could go either way. I have chosen to call it Saldanha Limestone Strandveld due to the presence of a few species characteristic of this vegetation type, and the presence of broken up lumps of calcrete, but it cannot in any way be regarded as typical Saldanha Limestone Strandveld. The only patches of this vegetation type on site that can be regarded as more typical are the inland ridges southeast of the main hill, and it is no coincidence that this is exactly where most of the characteristic limestone endemics are to be found (see Figure 1).

Langebaan Dune Strandveld is restricted to the area from Yzerfontein north along the coast (never more than 2km inland) to Rocher Pan, and usually occurs on alkaline sands. Some 65% of its original extent remains, and it thus regarded as a Vulnerable vegetation type, although its national conservation target (24%) has been achieved, primarily within the West Coast National Park (Rouget et al 2004). I do not regard the vegetation on site as being part of this unit.

Saldanha Flats Strandveld is regarded as threatened in terms of the National Biodiversity Assessment (NSBA; Rouget et al 2004), and is classified as Endangered in a national context. This vegetation type typically occurs in the areas between the coastal Dune Strandveld and the inland Sand Fynbos, and on this site occupies the low lying sandy flats on the more coastal half of the site.

Hopefield Sand Fynbos occurs on acid sands in the area from Yzerfontein north to Hopefield and the Berg river, and is classified as Endangered in a national context. Only 59% of this vegetation type remains, and the conservation target (30%) is far from being achieved, as virtually nothing is conserved (0.4% formally, and 1.8% informally; Rouget et al 2004). On site this vegetation type is restricted to the eastern third of the site, and has been impacted by previous disturbance.

Saldanha Limestone Strandveld occurs strictly on exposed limestones or calcretes (see Plate 1), in the area from Yzerfontein north to Paternoster. This vegetation type was very poorly mapped by Mucina & Rutherford (2006), but is regarded as being Endangered on a national basis, with 59% of its original extent remaining, and almost nothing conserved (Rouget et al 2004). The vegetation type is rich in rare and endemic species (Helme & Koopman 2007).

Saldanha Granite Strandveld occurs on granites and granite derived soils in the Saldanha and Vredenburg areas, and is also regarded as an Endangered vegetation type, with only 30% of its original extent remaining, and a national conservation target of 24%, but only 9% conserved (Rouget et al 2004). The vegetation type is also rich in rare and endemic species (Helme & Koopman 2007), and is the most localised vegetation type on site, being restricted to the main diorite hill.

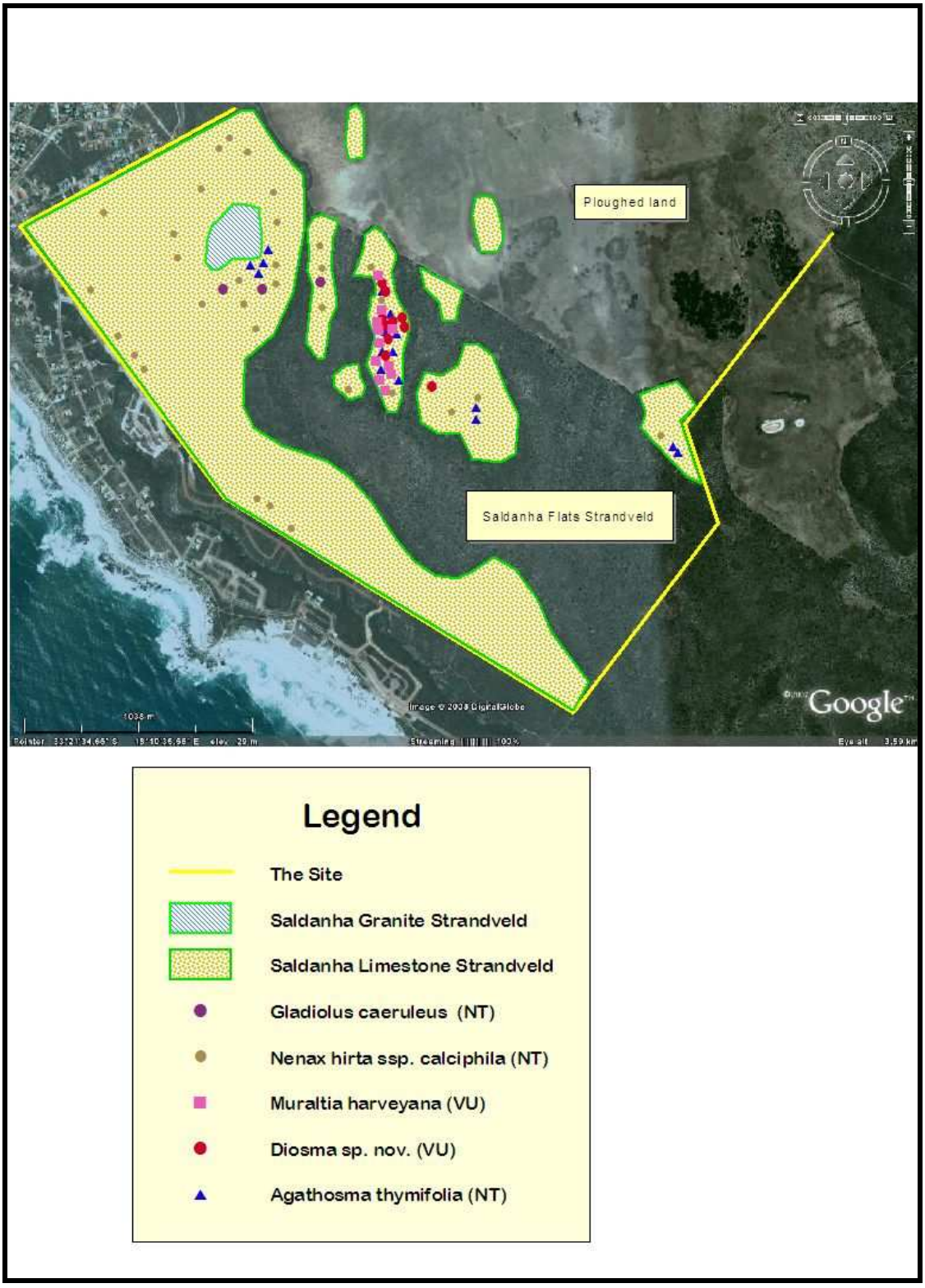

Figure 1: Vegetation map of the southern part of the site, showing approximate distribution of Red Data Book plant species recorded. The Saldanha Flats Strandveld is unhatched, and the boundary between the pristine examples of this and the ploughed lands can be clearly seen.

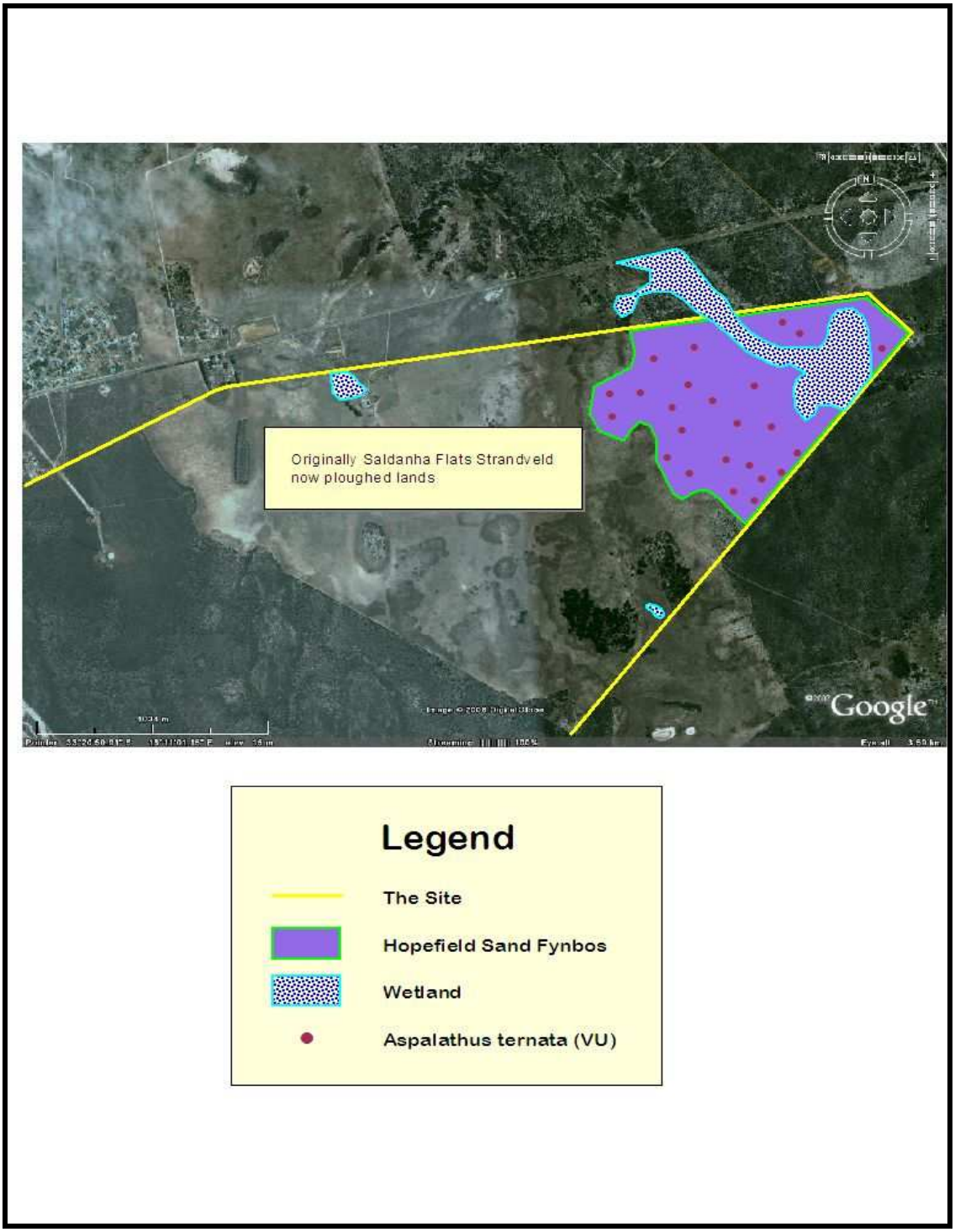

Figure 2: Vegetation map of the northern part of the site, showing approximate distribution of Red Data Book plant species recorded. The Saldanha Flats Strandveld is unhatched, and the same boundary between the pristine examples of this and the ploughed lands can be clearly seen.

Fire is not a significant driver of ecological process or pattern in the Strandveld vegetation types, but is important in Hopefield Sand Fynbos. The most important determinant of pattern in the Strandveld is soil type, followed by distance from the sea (De Villiers et al 2005). Most of the original edaphic (soil) interfaces in the interior parts of the site have been destroyed by agriculture, but limestone, granite, and sand interfaces all still occur on the western side of the site.

Woody alien plants are not a feature of the undisturbed parts of the site, but alien Acacias (*A. cyclops* – rooikrans, and *A. saligna* - Port Jackson) are common on the disturbed inland areas.

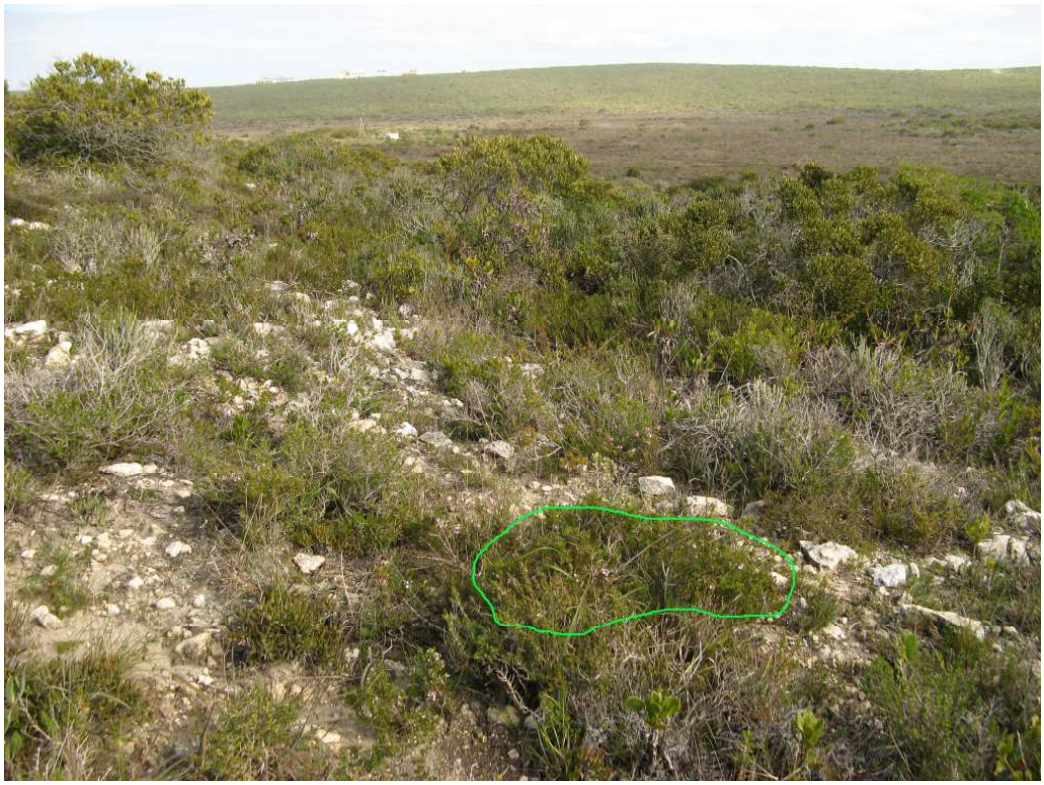

Plate 1: View of Saldanha Limestone Strandveld on a ridge southeast of the main hill, looking southwest towards the Pearl Bay ridge. Note the characteristic chunks of white calcrete (limestone) at the surface. The small pink flowers in the foreground (green outline) belong to the Red Data Book listed shrub *Muraltia harveyana.* The flats behind the foreground ridge support the dark restios typical of Saldanha Flats Strandveld, with the more coastal Limestone Strandveld on the ridge behind.

Rare species

Figures 1 and 2 plot the approximate known distributions of the rare plant species thus far recorded on the site. Six Red Data Book (RDB) listed plant species were recorded on site, five of which are restricted to the Limestone Strandveld areas (Figure 1), and the sixth is restricted to the acid sands of the Hopefield Sand Fynbos area (Figure 2). There is considered to be a Low to Medium likelihood of further rare species (primarily bulbs) being found on site, but only in the undisturbed areas. Most of the rare species are illustrated in the West Coast Flower Guide (Manning & Goldblatt 1996).

Aspalathus ternata is a common species in the previously disturbed but currently rehabilitating Sand Fynbos areas in the east of the site (see Figure 2 and Plate 2). The species is quite widespread in the Hopefield region, but has suffered extensive habitat loss and degradation, and is consequently RDB listed as Vulnerable (Raimondo et al – in prep).



Plate 2: View of the rehabilitating Hopefield Sand Fynbos in the eastern part of the site, with zonkwasriet (*Willdenowia incurvata*) dominant (background). The silvery shrub in the foreground is the Red Data Book listed *Aspalathus ternata*.

Muraltia harveyana is RDB listed as Vulnerable (Raimondo et al – in prep)., and is also restricted to Saldanha Limestone Strandveld. This low shrub is quite common on the inland limestone ridges (see Figure 1), but was not observed elsewhere on site.

Nenax hirta ssp. *calciphila* is perhaps the commonest of the Red Data Book listed species on site (see Figure 1), and is widespread wherever Saldanha Limestone Strandveld occurs. The species is however endemic to this vegetation type, and thus occurs only from Yzerfontein to Cape Columbine, and is consequently RDB listed as Near Threatened (Raimondo et al – in prep)., which is the lowest category of threat.

Another Near Threatened species is the kalkboegoe *Agathosma thymifolia*, which usually occurs on limestones, and in this area is found in patches within the Limestone Strandveld, where it may be common.

Gladiolus caeruleus (Saldanha pypie) is also listed as Near Threatened, and is sparsely distributed on the limestones on site, extending north to St Helena.

The final species of conservation concern is an undescribed species of buchu (*Diosma* sp. nov. cf. *guthriei*), which until found here was only known from a handful of localities in the area between Jacobsbaai and Cape Columbine, and thus its discovery here is of some interest. The species appears to be locally common but very patchy on the inland limestone ridges (see Figure 1), and has been RDB listed as Vulnerable (Raimondo et al – in prep). The species does not appear to have been collected at all prior to about 2003 (pers. obs.), and is most closely related to a species from the limestones near Struisbaai. It is interesting that a shrubby and quite distinct buchu species should have been overlooked for so long.



Plate 3: View southwest from the granite hill, showing Saldanha Flats Strandveld area in low lying areas (outlined in blue), with inland limestone ridges to east (left) of this and coastal limestone ridge to the right.



Plate 4: View of important wetland area in eastern part of site, crossing the Hopefield Sand Fynbos. The large restio is *Elegia elephantina* and is restricted to the Sandveld area between Aurora and Melkbos.

6. ASSESSMENT OF CONSERVATION VALUE

Conservation value is a product of various factors, including habitat integrity and functionality, ecological connectivity, presence of rare species, local and regional rarity, species diversity and extent of habitat loss within the region.

To keep things simple the site has been divided into only three different levels of conservation value – Low, Medium and High (see Figures 3 & 4).

High conservation value areas thus usually support at least 80% of the expected point diversity of such a habitat; are ecologically connected and functional; support viable populations of at least two rare species; and are often part of a vegetation type that is restricted to the region and poorly conserved. These areas are regarded as highly sensitive to development and disturbance and are not appropriate areas for development.

Medium conservation value areas are usually partly disturbed but usually support anywhere between 20% and 80% of the original species diversity of an undisturbed example of the habitat; may support viable numbers of a subset of the rare species typically encountered in undisturbed examples of this habitat; are usually considered rehabilitable; and often include important ecological corridors (linkages) across what would otherwise be viewed as Low conservation value land. The areas may be invaded by alien vegetation, or they may be largely pristine, in which case they lack important populations of rare or localised plant species. These areas could be considered for limited development, provided that adequate ecological corridors are maintained through the overall area.

Low conservation value areas are typically previously cultivated, with low levels of plant diversity - typically less than 15% of what would have originally have occurred prior to cultivation. Populations of rare or localised plant species are unlikely, and if they do occur are not likely to be regionally significant. These areas may have some ecological support value, but they do not usually have important ecological corridor value. These areas could support relatively high density development without significant ecological impacts.

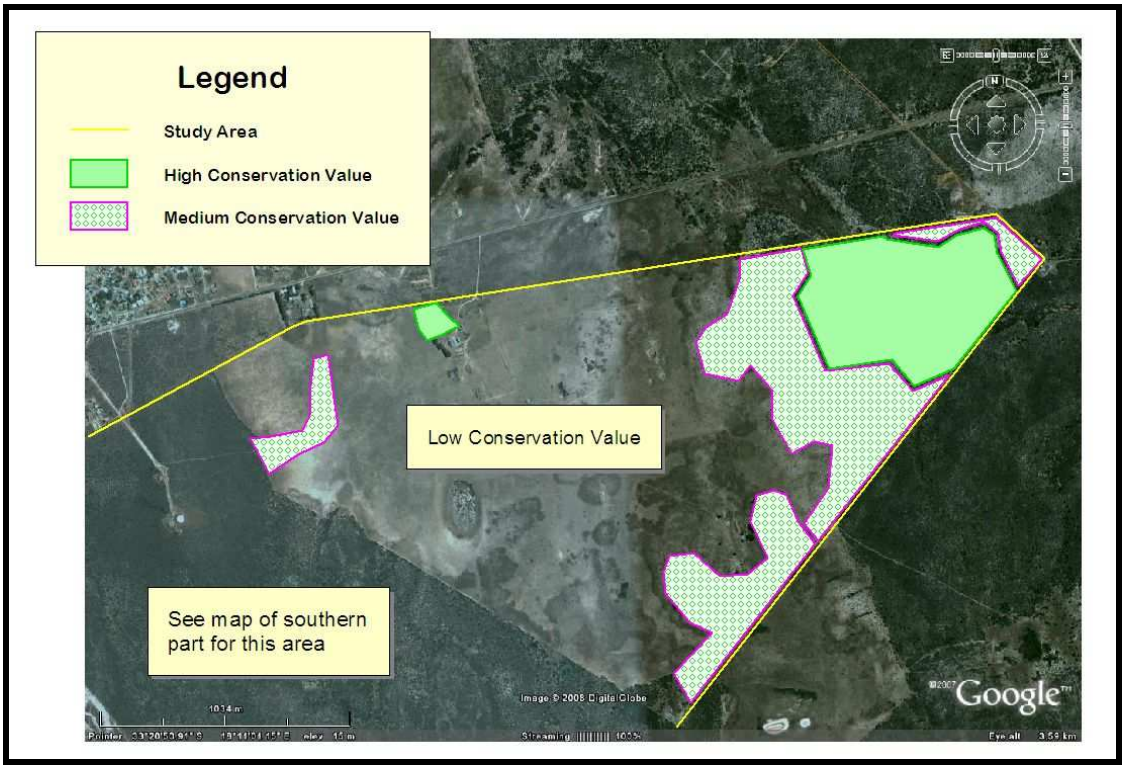

Figure 3: Conservation Value map for northeastern part of the site. Note that Low conservation value areas in this part of the site are unhatched. The Medium conservation value areas incorporate some notional ecological corridors across otherwise Low conservation value ground.

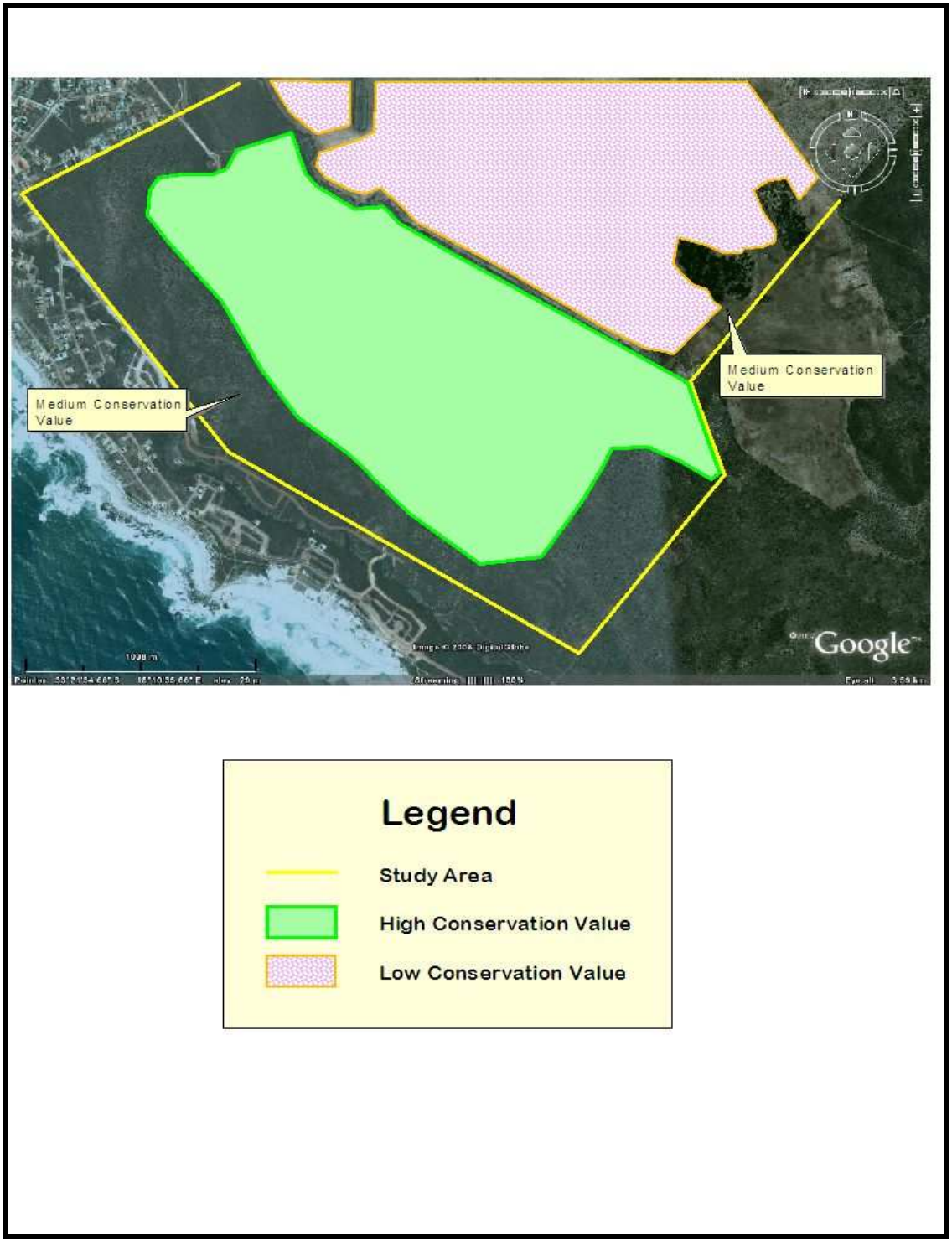

Figure 4: Conservation Value map for southwestern part of the site. Note that in this figure the Medium conservation value areas are unhatched, and incorporate some notional ecological corridors.

7. CONCLUSIONS AND RECOMMENDATIONS

- Figures 3 and 4 should be used as planning guidelines.
- The large central area of High conservation value should be regarded as the core conservation area on the property and should ideally be formally recognised as such, preferably by means of contracting this area into the Stewardship Program of CapeNature. If possible this area should be connected up with important natural areas to the south and southeast of the site. The core area supports the bulk of the rare species on site, three different threatened vegetation types, most of the edaphic (soil) interfaces, most of the aspect differences, is largely pristine, and is undoubtedly an area of high local and regional conservation value. Development in this area is not recommended, and any development in this area would consequently have to be very well motivated.
- Any development should ideally be concentrated in the Low conservation value area, which supports no rare species, and which has been previously ploughed. Development of this part of the site should not have any negative ecological effects on the rest of the site, provided that adequate ecological buffers (at least 30m wide) are maintained around sensitive areas, and ecological corridors are maintained across the site, connecting all priority conservation areas.
- Limited development could be acceptable in the Medium conservation value area in the west and in the east, provided that its total footprint does not exceed 30% of the Medium conservation value area in the west and east respectively. Any development plans should take into account the need for ecological corridors, which should be a minimum of 100m wide (the wider the better).
- No pipelines, roads, or bulk services should be routed across areas of High conservation value.
- Rehabilitation of disturbed areas (currently either of Low or Medium conservation value) is an option that could be considered to help mitigate certain development impacts. Rehabilitation should include ongoing alien vegetation removal and control, and replanting of selected locally indigenous plant species.
- Fire is a necessary ecological feature of the Hopefield Sand Fynbos, and any development plans should take this into account. This means that

development in this part of the site (extreme eastern area) is not really compatible with proper ecological management. The remainder of the vegetation on site does not need fire as part of its life cycle, which simplifies the ecological management of the area.

- Any development layouts must be subject to a detailed botanical impact assessment in order to minimise impacts and maximise ecological benefits. At this stage a faunal expert should also provide comment on proposed layouts, and should be asked to provide extensive mitigation recommendations.

8. REFERENCES

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