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Dear Chris

REPORT ON VEGETATION IMPACTED UPON BY PROPOSED DEVELOPMENT ON PORTIONS 1-187 (OF REM) OF THE FARM ALICEVILLE NO. 2147

1. Introduction

I previously supplied vegetation reports for development of this property, which were utilized during an environmental assessment process. The first report was supplied dated 3 December 2004, with a more expansive report supplied afterwards, dated 11 March 2004. At that time a development was conceptualized involving upmarket residential units. Various other vegetation specialists were also contracted to supply vegetation reports. These helped inform a footprint that was authorised through an environmental assessment process. Services were installed on the site but a development downturn had particularly strong effects on the KwaZulu-Natal South Coast and there is still an oversupply of upmarket residential estate developments and sites, rendering a similar concept unviable.

I am informed that the developer now wishes to continue with development of the property for a retirement village and associated facilities, for which it is believed there is a need. This will involve smaller, less costly units and more of them. Subsequent to supply of the previous reports, a back area of the property that was invaded by *Eucalyptus grandis* (Saligna Gum) trees was sold to become in large part the Umdoni Retirement Village, and so the area that can be developed is now somewhat smaller than it was then.

I have been asked by Pippa la Cock, the environmental consultant involved in the previous development and currently assisting with taking the new concept forward,

to revisit my earlier reports. The purpose of this is to verify whether the original reports are still relevant, given changes in vegetation that may have occurred since 2004 and 2005, and new areas are affected by the June 2014 proposed footprint (this footprint may be provisional and could change in future). It is first necessary to review what applies in terms of legislation relating to this vegetation.

2. Statutory protection of forests

Much of the property is covered by forest. The Act records that “natural forests shall not be destroyed save in exceptional circumstances where, in the opinion of the Minister, a proposed new land use is preferable in terms of its economic, social or environmental benefits” [Section 3(3)(a)]. In practice this means that development with these impacts cannot lawfully occur without permission being granted accorded to the criteria of the Act by the responsible authorizing agency, namely the national Department of Agriculture, Forestry and Fisheries (DAFF). This was the case during the previous environmental assessment process, in which DAFF was a stakeholder, but encroachments into any new forest areas not approved by DAFF before would at least require approval and comment from this department again.

3. Promulgation of threatened ecosystems

The area in which the property falls is one of more than 200 ecosystems included in a National List of Threatened Ecosystems in South Africa gazetted (Government Notice 34809, 9 December 2011) in terms of the National Environmental Management: Biodiversity Act (NEMBA) (Act 10 of 2004).

According to the listing notice:

The purpose of listing threatened ecosystems is primarily to reduce the rate of ecosystem and species extinction. This includes preventing further degradation and loss of structure, function and composition of threatened ecosystems.

The listing does so by making applicable national environmental regulations (R546 of 2010) that require a Basic Assessment process if clearing of more than 300 m² of a Critically Endangered or Endangered ecosystem is proposed. There are also: “Planning related implications, linked to the requirement in the Biodiversity Act for listed ecosystems to be taken into account in municipal IDPs and SDFs”. The implication then is that municipalities should plan development to avoid or minimise adverse impacts on these kinds of ecosystems.

Environmental authorities (in this case the provincial DAEA) also tend to scrutinise development proposals within threatened ecosystems with greater care, and they receive closer attention from interested and affected parties (particularly the provincial conservation authority Ezemvelo KwaZulu-Natal Wildlife).

The site falls within a Critically Endangered listed ecosystem, namely Southern Coastal Grasslands, KZN 18 (SANBI 2009). According to SANBI (2009) it is listed according to Criterion F because it comprises: "Priority areas for meeting explicit biodiversity targets as defined in a systematic biodiversity plan" with "[v]ery high irreplaceability and high threat."

This ecosystem is an amalgam of different vegetation types "delineated by the Indian Ocean in the east, inland to within 1 km of the coast and running parallel to the coast following an approximate altitude of up to 150m. It includes small coastal forest and shrub patches that encroach inland up the estuaries."

It should be mentioned, however, that most good quality vegetation has already been transformed (destroyed or severely degraded) within this ecosystem, with only 6% of the natural vegetation of the area remaining. Key biodiversity features are stated to be:

[O]ne amphibian, *Hyperolius pickersgilli*; two millipede species including *Centrobolus anulatus* and *Doratogonus infragilis*; three plant species for example *Kniphofia rooperi* and *Phylica natalensis*; three reptile species for example *Bradypodion caeruleogula*, *Bradypodion melanocephalum* and *Bradypodion wezae*; and five vegetation types including KwaZulu-Natal Coastal Forest [included within the Northern Coastal Forest of Mucina & Rutherford (2006)] , KwaZulu-Natal Dune Forest, Pondoland Scarp Forest, Pondoland-Ugu Sandstone Coastal Sourveld, KwaZulu-Natal Coastal Belt.

No Pondoland Scarp Forest or Pondoland-Ugu Coastal Sourveld occurs as far north as the property. No dune forest occurs on this particular site except for a transformed and degraded remnant on a dune on its eastern extent. Of plants mentioned, *Kniphofia rooperi* and *Phylica natalensis* are not known as far north as this property, but the equally rare *Kniphofia littoralis* was previously found by me in grassy scrub next to railway line where outside the footprint of the previous or June 2014 proposed footprint. This species is Red Listed as Near Threatened (Raimondo et al 2009).

4. Change in national vegetation classification

In 2006, after supply of my earlier reports, a new National Vegetation Classification and Map was published (Mucina & Rutherford 2006), which has subsequently undergone some minor refinements (Scott-Shaw & Escott 2011). Most of the inputs into the National Vegetation Map for KwaZulu-Natal originated from within Ezemvelo KwaZulu-Natal Wildlife, with Boyd Escott and the late Rob Scott-Shaw playing an important role. As a result it is possible to refer vegetation on the property to a classification that was unavailable then.

The site is situated within a vegetation type designated as KwaZulu-Natal Coastal Belt Grassland (Scott-Shaw & Escott 2011) corresponding with the KwaZulu-Natal Coastal

Belt of Mucina & Rutherford (2006). According to Scott-Shaw & Escott (2011) it is Critically Endangered. It is a: “Long and in places broad coastal strip along the KwaZulu-Natal coast, from near Mtunzini in the north, via Durban to Margate and just short of Port Edward in the south. Altitude ranges from about 20–450 m.”

It is described as comprising:

Highly dissected undulating coastal plains which presumably used to be covered to a great extent with various types of subtropical coastal forest ... Some primary grassland dominated by *Themeda triandra* still occurs in hilly, high-rainfall areas where pressure from natural fire and grazing regimes prevailed. At present the KwaZulu-Natal Coastal Belt is affected by an intricate mosaic of very extensive sugarcane fields, timber plantations and coastal holiday resorts, with interspersed secondary *Aristida* grasslands, thickets and patches of coastal thornveld.

Forest on the site is now classified as Northern Coastal Forest, which is nested in the KwaZulu-Natal Coastal Belt and are described as mainly occurring in KwaZulu-Natal at low altitudes (10–150 m). They are described as “species-rich, tall/medium-height subtropical coastal forests on coastal (rolling plains) and stabilized sand dunes” (Mucina & Rutherford 2006. Although assessed as “Least Threatened in general” this forest in primary form has been reduced over historical extent. However much of the forest currently referred or mapped to this vegetation type is younger forest of more recent origin that expanded into once more open areas, and which has somewhat lower biodiversity value. This property is more unusual in that it includes some large, old growth cores in addition to younger forest.

5. Comments on development of the property

This property is particularly difficult to simultaneously achieve good development and environmental outcomes on. Ordinarily, the role of a vegetation specialist is to map plant communities and assess their conservation value. Good environmental management practice is then to focus development on lower value components and exclude and buffer those that are conservation significant. Except for small scale development, this cannot be achieved on this property as there is a more uniform spread and occurrence of conservation significant vegetation communities that include forest, grassland and wetlands (although development is not proposed in wetland areas that have been mapped by a wetland specialist). As a result even modest development of the property will result in the loss of grassland or forest, and more extensive development will cause more.

At the time of the supply of the original reports the issue of buffers was still contentious and 20 metres had been recommended for forest communities by Prof. Mike Lawes, in respect of a development proposed next to Durban’s Hawaan Forest. This view was influential at the time, but since then even larger buffers of 30 metres or more came to be recommended and implemented for many developments. The

issue of the buffer sizes that are appropriate to particular vegetation communities and development types has still not been resolved satisfactorily, with contention between various parties.

6. Provisos

There is not much of an issue assessing woody vegetation in the winter months, particularly on the KwaZulu-Natal Coast, as trees and much of the herb layer of tree and forest communities are still visible. However, there is some difficulty in assessing open areas, particularly grassland. This is because in winter many grassland herbs and geophytes die back and either become inconspicuous or invisible if they have a below ground presence only. This difficulty is increased if grassland is tall and moribund (i.e. has not been recently burned) as much of the diversity that may be present is covered beneath this grass. This was the case on this property. As a result one needs to be cautious in pronouncing upon the biodiversity value of grassland under these conditions. However, observations could be made and some changes are evident.

7. Field observations

I visited the site on 5 June 2014 in your and Pippa la Cock's company and then unaccompanied on 9 June 2014 to establish changes to vegetation over the past decade, and look more closely at the impacts the June 2014 proposed footprint would have on it.

Having reviewed the reports again, against updated onsite work, I stand broadly by the descriptions of vegetation and recommendations made. However, there have been changes in the more open grassland areas that need to be stated.

There are three grassland areas on the site (which abut or include wetlands mainly comprised of hygrophytic grasses and sedges and which cannot be readily distinguished by an unfamiliar eye or from aerial photography). Wetland areas are not addressed except where vegetation indicating wetness appears to extend outside the areas mapped as wetlands by a wetland specialist, as no development is proposed in these mapped areas.

The grassland areas are readily seen in aerial photography, with one closest to the coast, an intervening smaller grassland arm closely enclosed by Northern Coastal Forest, and the most landward grassland arm on the more western part of the property, also closely enclosed by forest of this type. These are referred to as the coastward, middle and landward grasslands respectively. In my report dated 11 March 2005 I believed that due to scrub and alien plant encroachment these grasslands could be lost in 10 to 15 years without management. That they have not converted to this state is partly due to alien control work and episodic (but still insufficient burning) that was implemented subsequently – see further comments below.

7.1 Coastward grassland

This grassland area is shown at point G1 in Appendix 1. It is somewhat misleading to refer to this as dryland grassland as some of the substrate is damp and there are parts that appear wet, containing hygrophytic species, outside of the areas mapped as wetland by a wetland specialist. The hygrophytic vegetation appears to extend to about the northern edge of the wetland buffer, and to occur in at least two smaller patches beyond (shown as blue polygons) in Appendix 1.

There was a significant alien plant problem in these open areas when the property was visited in 2004 and 2005. Most conspicuous was invasion by *Chromolaena odorata*. Since then, the *Chromolaena odorata* has been nearly entirely cleared. However, some other aliens are now present.

All grassland on the property has been episodically burned but I was informed by Pippa la Cock that cool burns had been implemented due to concerns expressed by residents of neighbouring property. In my experience, one of the principal problems in maintaining small areas of grassland next to residential development is that residents oppose and complain about burning, even though it is essential for maintaining grassland health and plant biodiversity.

In any event the grassland was mainly moribund. There appears to have been an increase in several problem grass species. The most significant is *Melinis minutiflora*. This grass is recorded by SANBI as indigenous (Germishuizen et al 2006) but tends to form dense, monotypic stands that suppress and cover other plant growth. As a result, this is incompatible with long term maintenance of plant biodiversity. This grass does not survive regular burning or grazing, where growth is kept continuously low as it is not very long lived and inflorescences and seeds develop at some height above the plants. It is also killed by hot fires. The management regime in this grassland, which appears to have comprised infrequent, cool burning is therefore conducive to dominance by this grass and loss of other plant biodiversity. Other indicators of this are a large occurrence of the grass *Cymbopogon validus*, another essentially undesirable, large species and scrub precursor. A further grass is in my opinion undesirable, although as far as I know is not regarded as such in grassland and pasture management literature. This is *Digitaria eriantha*. It is a taller grass that tends to overtop other species (particularly herbs) and grasslands dominated by this grass have in my experience low plant diversity.

The area of this grassland that does not comprise these undesirable grasses and in which some herbs are still evident is mapped a green polygon in Appendix 1. This grassland area includes *Aristida junciformis* but is not secondary grassland as it does contain a small number of herbs that either would only occur in primary grassland, or on a legacy basis in grassland that has been or is being degraded, and which without intervention or reversal will then transition to secondary state. Secondary grasslands

are grasslands that contain a small number of species, with the herb component comprising weeds or at best a few common pioneers.

7.2 Middle grassland

This grassland is shown at point G2 in Appendix 1. This grassland is also moribund and contains undesirable species. However, it contains more (though still not a large number) of herbaceous species than the coastward grassland, and particularly large numbers (estimated at hundreds) of *Watsonia densiflora* plants. For this reason it is not in the main assessed as secondary grassland, and because the grass is moribund it may contain more plant diversity than can be seen. There are some examples of what is most likely a Red Listed plant in it, namely *Senecio dregeanus* in proximity to point S1 that is shown in Appendix 1. Plants were not in flower (it flowers some months earlier). This species is Red Listed as Vulnerable (Raimondo et al 2009). In my experience (I have seen it at four other localities in KwaZulu-Natal in the past) it has a preference for scrubby grassland.

Although the *Chromolaena odorata* presence is almost gone, there is a significant presence of other alien plants. Most conspicuous is an abundant alien member of the *Tibouchina* family (possibly *Melastoma septemnerium*, with it not possible to identify to species exactly by time of writing this report).

7.3 Landward grassland

This is the grassland that is most different to what was seen almost a decade ago. This area was most extensively invaded by *Chromolaena odorata*, and the *Chromolaena* is almost entirely gone. This grassland has areas that are more dryland, similar to the Middle Grassland. However, it has a large area where the soil appears damp and may be a wetland area, based on vegetation present. The main indicator is the fern *Nephrolepis biserrata*. This area is mapped and shown in Appendix 1 as a large blue polygon. If it is wetland this will need to be confirmed by a wetland specialist. This area, its edges and some area beyond is invaded extensively by the alien member of the Melostomataceae already mentioned, which has begun to form closed thickets in places. This species was evidently not recognized for what it was when more familiar alien plants were controlled on the site over the past decade.

8. Other comments on vegetation affected by the June 2014 footprint

8.1 Dune area

This area was the most degraded part of the site when first assessed and still comprises the least valuable vegetation. However there are some large indigenous trees in this area, including trees that though common on dunes are protected by the National Forests Act. The principal species involved is *Mimusops caffra* (Coastal Red Milkwood). Ideally these trees should be mapped out and accommodated around buildings, and I cannot be sure whether at the density proposed this will always be

possible. Under both the original footprint and June 2014 footprint proposal a band of Northern Coastal Forest on its landward side would also be developed.

8.2 *Kniphofia littoralis* area

The area in which *Kniphofia littoralis* was previously seen is shown as a yellow polygon/line in Appendix 1. Although it appears to be beyond the development footprint, it is important to avoid impacts on it.

8.3 Forest

The previous footprint was positioned on forest edges extending into part of each grassland. It did not encompass all of the grassland therefore, and did not extend to both edges of the forest as the June 2014 footprint does now.

The edges now affected by the June 2014 proposal do not comprise the old growth cores on the site, but is forest of more recent origin. However the forest is tall and has good structure. A tree in all these areas, both in forest edges and with a few freestanding is *Cassipourea gummiflua* subsp. *verticillata* (Large-leaved Onionwood). This is Red Listed as Vulnerable (Raimondo et al 2009), which is a high category. It is, however, quite often seen by me in the KwaZulu-Natal coastal area, particularly on wetter sites. It was not possible to inventory and map the position of every tree during the time allowed for the recent visits but this could be done during follow up. This species is affected under the original footprint and June 2104 proposal.

Some of the forest on the site is not old forest but has expanded from the old growth cores. I have not mapped these cores, but they may have been by forest specialist Coert Geldenhuys. The only possibility for development away from areas already proposed for development would be in younger forest that does not comprise the old growth cores. If this is important and these have not been mapped, doing so would be useful to consider whether this could be a footprint alternative. However, this would in my opinion not offer much area for alternative development, and forest on the site which does not form part of the old growth cores, while lacking some of the species of the old growth cores, is still not degraded or poor forest.

9. Recommendations

What is captured above summarises my latest observations and changes seen since 2004/2005. I also believe that future development and any environmental authorisation for the property should restrict residents and owners to only growing indigenous plants in their gardens and landscape features, to minimize transformation of habitat close to forest and wetland edges and prevent garden escapes. I do not wish to make recommendations or comments about the suitability of footprints now proposed in detail, but do so briefly. The June 2014 footprint does give rise to concerns about impacts on vegetation as follows.

The issues more precisely are this:

- The new footprint now eliminates the remaining grassland outside areas that have been mapped as wetland by a wetland specialists. Grasslands that are now not secondary are rare on the KwaZulu-Natal South Coast, especially in the northern part of the area that includes this part of the site. There has previously been much attention given to forest on the property (which is legally protected and has a custodian in the form of the Department of Agriculture, Forestry and Fisheries). However, given the relative rarity of grassland, it can be disputed that conservation of one vegetation type should take precedence and that the losses should be spread more evenly.
- Even if they are degraded, these areas comprise habitat for fauna different from forest. The grassland and the forest also form an ecotone where they meet.
- The amount of development on forest edges would greatly increase, whereas good practice would be not to develop forest and apply buffers (which in 2014 are better recommended at 30 metres than 20 metres). However abiding by this principle would require much smaller scale development, even less than that of the footprint approved during the previous environmental authorisation process.
- The forest edge is an area of dynamism which moves over time, and contains a greater number of light-loving or pioneer species. Fire is an important in maintaining this dynamic. Different fauna also utilize the ecotone. Once grassland is gone, ecotones will outside the mapped wetland areas become the edge of residential properties and gardens, and some of this dynamism and species composition would be lost. In the absence of fire, forest tends to inexorably expand, not expand and contract as under natural circumstances, and so this would alter the character of forest in these edge areas in a way different from that now and in the past. However, inadequate burning of grassland on this property (and many others abutting and near developed areas on the KwaZulu-Natal South Coast) has already undermined or ended dynamic processes along many forest edges.

At the same time the following is noted, and this is also important to take into account:

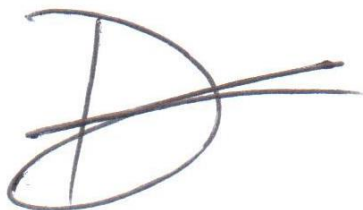
- The property is difficult or impossible to develop at any scale without some conservation vegetation not being eliminated or transformed in the process.
- The grasslands are under considerable pressure from under-burning and alien plant invasion. While alien control (of better known species) has occurred and sufficient burning has taken place to prevent conversion to scrub – this has been something of a holding action as there appears to have been a deterioration in other respects. There will be a further deterioration in the

amount of species diversity without better management in future (in which support from neighbouring residents would also be important). A large amount of this grassland, particularly where covered by *Melinus minutiflora*, may already comprise little other plant biodiversity, although burning of off this grassland and inspection in the summer months would be needed to confirm.

- One needs to be realistic about the quality and consistency of alien plant control and fire management that will occur in these areas in future and so prospects of keeping them in open state, even if under the auspices of a homeowners association or body corporate.
- Insofar even as the original footprint is concerned, extending houses part way into the grassland then places additional difficulty on burning what remains, given that the areas are narrowed, closely abut houses/development and there would inevitably be discomfort or opposition from many residents about burning close alongside. Even under the more conservative original proposal or a more conservative proposal than provided in June 2014, this would increase the chances of failure of management of these areas, and loss of what remains to scrub and woody vegetation in future.
- Positioning houses next to grassland also causes edge effects, which may include disturbance, increased alien plant invasion (including of nuisance weeds) and even dumping of garden refuse. The deterioration of grassland along fence lines and the boundaries of development has been observed on many sites by me, and these (particularly the first two features) will likely occur to some extent in any grassland retained next to developed areas.
- Except for *Cassipourea gummiflua*, the forest encroached upon do not appear to include other rare or Red Listed species.

Should you have any queries please do not hesitate to contact me through details above.

Yours sincerely

A handwritten signature in blue ink, consisting of a large, stylized capital letter 'D' with a horizontal line extending to the right from the middle of the letter.

David Styles

References

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APPENDIX 1: Mapping



KEY:

D – Dune area comprising degraded vegetation and some large indigenous trees, with a strip of Northern Coastal Forest behind

G1 – Landward grassland, with wetland area mapped by wetland specialist alongside not shown

G2 - Middle grassland

G3 – Landward Grassland

S1 – Approximate area of occurrence of *Senecio dregeanus* plants (Vulnerable)

Yellow polygon (outside property): Area of occurrence of *Kniphofia littoralis*

Blue polygons: Near G1 – Smaller patches of wetland vegetation outside wetland mapped by wetland specialist. Near G3 – larger area of hygrophytic plant growth.

Green polygon: Remaining area of better quality, though still degraded grassland

APPENDIX 2: Photographs



2.1: The small area of better grassland dominated by *Aristida junciformis*, which contains a small diversity of forbs that do not occur in secondary grassland. This is the area within the green polygon shown in Appendix 1.



2.2: Area of grassland in the area G1 (coastward grassland) here dominated and invaded by the grasses *Melinus minutiflora* and *Cymbopogon validus*. These species are undesirable and exclude other plant diversity. Little diversity may still remain in these parts, although this needs to be confirmed in the summer months after the grass has been burned.



2.3: Area of grassland in the area shown as G2 (middle grassland), invaded by an alien member of the Melastomataceae family (possibly *Melastoma septemnerium*), a new and apparently undocumented invader and garden escape in South Africa, with *Watsonia densiflora* in the grassland around. Northern Coastal Forest is in the background.



Top left: The same alien member of the Melastomataceae in the area of G3 (landward grassland) indicated in Appendix 1.

Above right: *Senecio dregeanus*, not photographed on this property.

Below: The area containing hygrophytic vegetation, shown as the largest blue polygon in Appendix 1.

