KEURBOOMS RIVER
ERF 155: VEGETATION SENSITIVITY ANALYSIS

PREPARED FOR FERPA (PTY) LTD

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1. INTRODUCTION

1.1 Terms of reference

Ken Coetzee of Conservation Management Services was contracted by Mr Andre Swart on behalf of his client to carry out a site sensitivity analysis of Erf 155 Keurbooms River in terms of a proposal by the landowner to develop the property for residential purposes.

The site was visited on Wednesday 3 October by Ken Coetzee and Bruce Taplin of Conservation Management Services to collect biophysical and landscape information for the study.

1.2 Credentials of the author

The author of this report, Mr Ken Coetzee, is registered with the South African Council for Natural Scientific Professions (Reg No 400099/08) as a “Professional Natural Scientist”, in the field of Ecological Science.

Mr Coetzee is a Master of Technology graduate of the School of Forestry and Nature Conservation of the Nelson Mandela Metropolitan University (Saasveld Campus) in the field of Ecological Science.

Mr Coetzee has over 40 years of relevant experience in the field of nature conservation and management, the most recent 20 years of which were self-employed as a biodiversity specialist consultant, involved in a wide variety of nature conservation, landscape planning, habitat evaluation, commercial game ranch and other development projects.

1.3 Methodology used for the survey

The method used was to traverse the study site from north to south and from west to east and to explore off each of these lines along animal and human footpaths wherever possible. Much of this exploration was done on hands and knees. It is very difficult to accurately survey a site on which visibility is poor or screened by bush and trees but we are confident that we have done so well enough for the requirement.

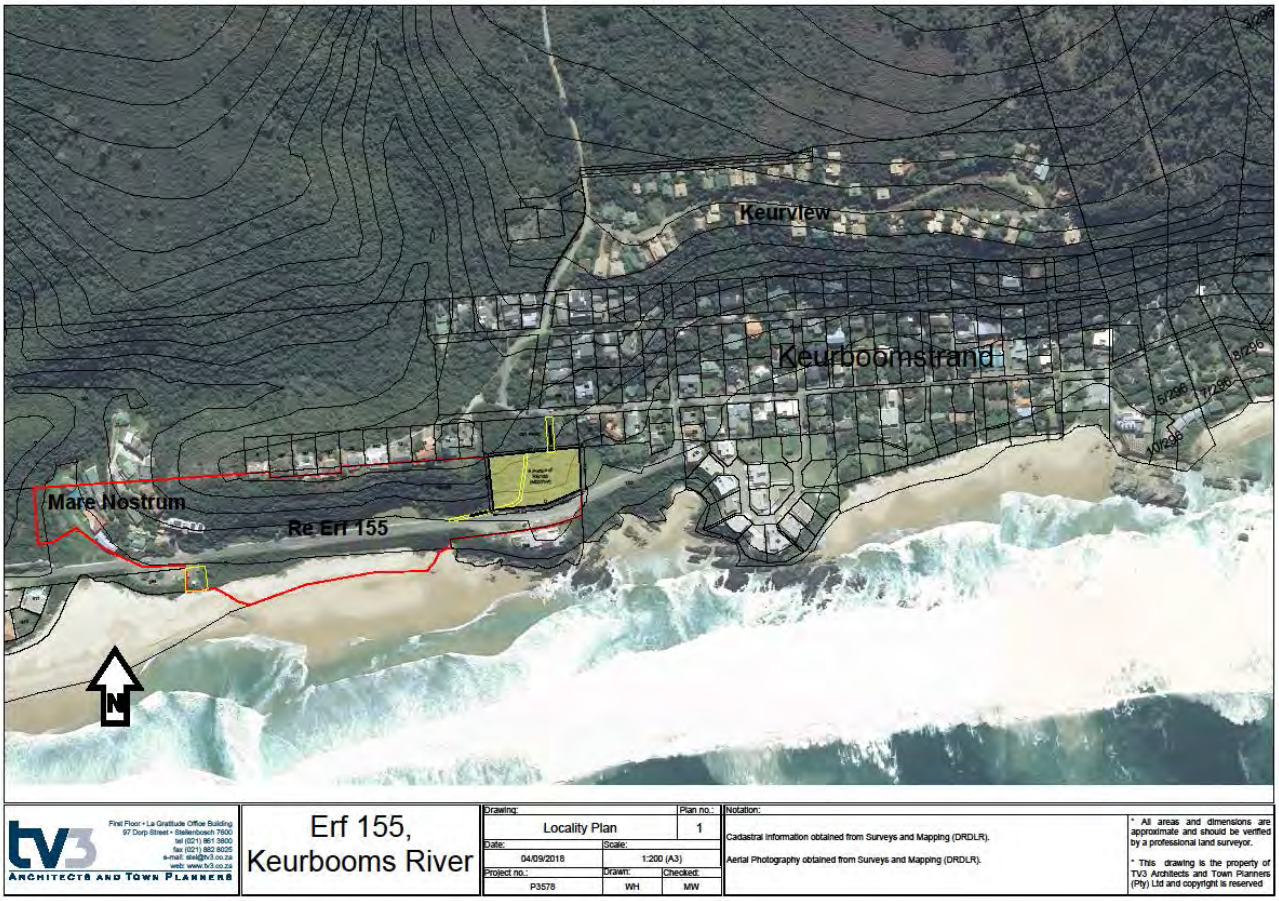
GPS co-ordinate readings were taken at sites of importance for the marking of the edges of the sensitive scrub forest patches (see Appendix 1).

A checklist was made of all the plants encountered along the exploration pathways as well as along the outer edges of the study site.

2. DESCRIPTION OF THE STUDY SITE

2.1 Locality and layou6t of the study site

Figure 1 shows the locality of the study site on the South Cape coast near to Plettenberg Bay.



First Floor • La Gratitude Office Building 97 Dorp Street • Stellenbosch 7600 tel (021) 861 3800 fax (021) 882 8025 e-mail: stel@tv3.co.za web: www.tv3.co.za tv3 ARCHITECTS AND TOWN PLANNERS	Erf 155, Keurbooms River	Drawing: Locality Plan Plan no.: 1 Date: 04/09/2018 Scale: 1:200 (A3) Project no.: P3578 Drawn: WH Checked: MW	Notation: Cadastral information obtained from Surveys and Mapping (DRDLR). Aerial Photography obtained from Surveys and Mapping (DRDLR).	* All areas and dimensions are approximate and should be verified by a professional land surveyor. * This drawing is the property of TV3 Architects and Town Planners (Pty) Ltd and copyright is reserved

<u>FIGURE 1</u>: Locality of the Keurbooms River Erf 155 study site.

Figure 2 shows the layout of the Erf 155 study site in relation to the other nodes of residential development in the area. Figure 2 does not clearly show that developed plots 13, 14, 15, 20 & 21 are all on top of a coastal escarpment and that Erf 155 is actually on a descending slope, from the top of the escarpment down to sea level.

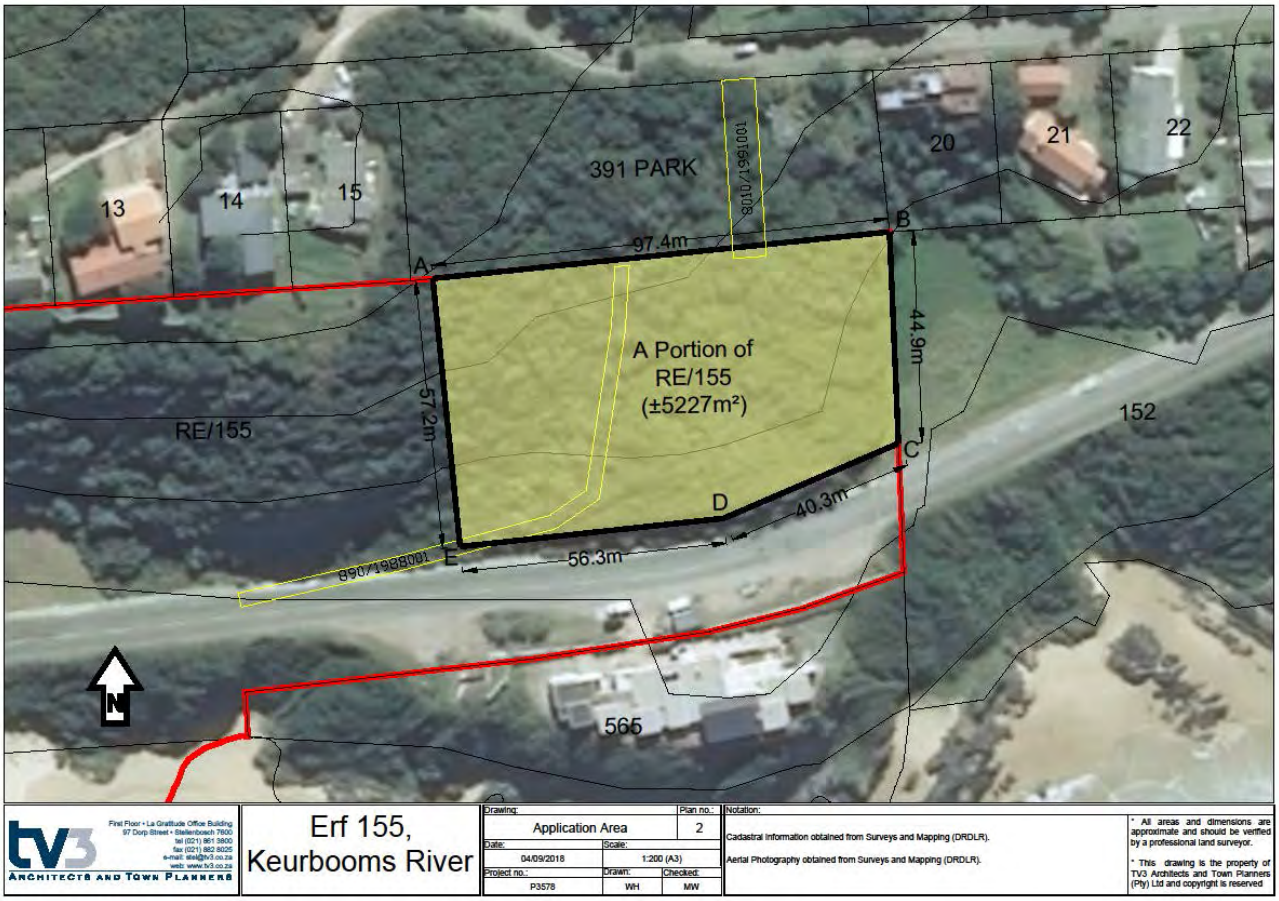


FIGURE 2: The layout of the study site. The potential access to the property is also shown.

2.2 Vegetation description

According to Mucina & Rutherford (2006) the study site lies within the Garden Route Shale Fynbos vegetation type, a feature of which is Afrotemperate scrub forest in the more fire protected areas and on the shale substrates. On the study site the fynbos and forest overlap somewhat and in the absence of fire the fynbos is changing into forest (see Plate 1). The site can be described as pristine coastal scrub forest and disturbed scrub forest/former fynbos. This description is similar to that of Vlok et al (2008) who at a fine scale, describe the vegetation of most of the study site as Keurbooms Thicket/Forest. A narrow band of fynbos still occurs along the Southern boundary.

2.2.1 Disturbed scrub forest/former fynbos: The disturbed part lies along a north/south central line of overgrown paths which are open and vegetated with large shrubs and fynbos plants. An old pipeline lies on an east/west axis roughly at the northern edge of the study site. The pipeline lies under a narrow terrace cut through the forest at about 4m wide (see plate 2). This “cutline” provided enough disturbance to encourage alien *Acacia cyclops* and *Acacia mearnsii* to invade the area as well as a number of other alien plants such as Crassula sp. and Yucca sp., presumably originating in dumped garden refuse. Because of the access paths there has been some dumping of rubble, rubbish and bits of pipe along the northern edge of the study site.

PLATE 1: Shale Fynbos at the extreme Southern edge of the study site.

PLATE 2: The narrow pipeline route through the upper part of the study site.

Within the disturbed Scrub-forest we found evidence that bark had been removed from the trunk of an indigenous tree, as is done for the indigenous healer Muthi-trade (see Plate 3).

PLATE 3: Bark removed from a tree, the stem is ringbarked and cut marks are visible above the removed section of bark.

The disturbed scrub forest was probably originally shale fynbos that has advanced closer towards a forest state due to a long-term lack of fire on the site. This vegetation type therefore represents a pioneer scrub forest phase and, in terms of forest vegetation, is less sensitive than the pristine scrub forest (see plate 4).

Typical plant species in this vegetation type are *Diospyros dichrophylla, Passerina falcifolia, Grewia occidentalis, Osyris compressum, Polygala myrtifolia, Pelargonium peltatum, Searsia lucida, Searsia crenata, Rhoicissus digitata, Osteospermum monilifera* and *Asparagus densiflorus.*

2.2.2 Pristine scrub forest: The pristine scrub forest consists of closed canopy forest with a leaf mould cover on the forest floor (see plate 5). This scrub forest has no undergrowth or growing plant ground cover on the shaded forest floor which indicates that it is undisturbed and therefore pristine. This scrub forest occurs on the steeper shale slopes (see Plate 6) of the general area and can thus be considered as very sensitive to disturbance from both a slope and vegetation point of view.

Typical plant species in this vegetation type are *Scolopia zeyheri, Sideroxylon inerme, Tarchonanthus camphoratus, Cassine peragua, Gymnosporia heterophylla, Scutia myrtina, Rapanea melanophloeos* and *Buddleja saligna.*

PLATE 4: An example of the disturbed pioneer scrub-forest.

PLATE 5: An example of the Pristine scrub-forest.

PLATE 6: The Pristine Scrub-forest on a steep slope as seen from the "outside".

2.2.3 Plant checklist

The following checklist is by no means a complete list of all the plants that occur on the study site. It contains the common and most plentiful plants and it provides a broad idea of what the vegetation consists of.

The pristine forest/thicket is probably most poorly represented in the checklist due to the density and height of the canopy (±4-5m). The disturbed forest/thicket is better represented as it is more open and the plants are more accessible.

Acacia cyclops
Acacia mearnsii
Buddleja saligna
Carissa bispinosa
Cassine peragua
Cassine tetragona
Chrysanthemoides monilifera
Diospyros dichrophylla
Ekebergia capensis
Grewia occidentalis
Gymnosporia heterophylla
Mystroxylon aethiopicum
Osyris compressum
Passerina falcifolia

Pelargonium peltatum
Pennisetum clandestinum
Polygala myrtifolia
Pterocelastrus tricuspidatus
Putterlickia pyracantha
Rapanea melanophloeos
Rhoicissus digitata
Scolopia zeyheri
Scutia myrtina
Searsia crenata
Searsia lucida
Searsia undulata
Senecio angularis
Sideroxylon inerme
Stenotaphrum secundatum
Tarchonanthus camphoratus
Tetragonia decumbens

2.3 Landscape connectivity

Figure 1 shows that Erf 155 is largely isolated in terms of landscape connectivity. There is thus no natural or important corridor on a north/south axis or on an east/west axis. East of the study site is completely developed, South of the study site is the coastal road and the sea.

West of the study site is an area of natural vegetation but it is cut off by residential development further to the West. To the north the area is relatively sparsely developed but roads and a line of houses prevents any useful corridor movement northwards.

In terms of landscape-connectivity the study site is not an important corridor, nor will a sensitively placed residence on it cut off any important existing landscape linkages. Micro-corridor movement onto and off the study site will continue as it has always done via the undisturbed scrub forest patches. The most important fauna in the forested area is the birds which will not be significantly affected by the proposed development. The proposed development footprint will, however, result in a small loss of avifaunal habitat.

The spoor and droppings of the ubiquitous bushbuck *(Tragelaphus scriptus)* was found on the paths on the study site. These animals probably use the site as part of a larger range within the relatively built up area. There is no danger of disadvantaging the local bushbuck population by means of the proposed development. A small area of habitat will be lost but bushbuck appear to adapt well to development and there will be more than enough space in the general area to accommodate the occasional bushbuck on Erf 155.

2.4 Site sensitivity

The entire study site lies within a Critical Biodiversity Area (CBA), so zoned in the hope of protecting what is left of the natural vegetation along the coast from ill-advised residential expansion and agricultural transformation.

The Garden Route Shale Fynbos is an endangered vegetation type, more than half of it has already been transformed for cultivation and pine plantations and much of the remaining natural veld has been converted into pastures (Mucina & Rutherford, 2006).

In the Garden Route Biodiversity Sector Plan for George, Knysna and Bietou Municipalities Vromans et al (2010) recommend that the desired management objective for a CBA is to maintain natural land, rehabilitate degraded land to natural or near natural and to manage for no further degradation. They state that land-use should not be approved.

This is somewhat of a problem in terms of the development of the study site as it lies within such a CBA area and the objective of proposed residential development is thus contrary to the Biodiversity Sector Plan.

It is a fact however that the vegetation on the study site can no longer be described as Garden Route Shale Fynbos because it has become forest/thicket due to the long exclusion of fires. The original fynbos has mostly been shaded-out. It does, however, still contain a few of the larger elements of the original Fynbos vegetation such as *Polygala myrtifolia, Passerina falcifolia, Osyris compressum* and *Osteospermum moniliferum.*

Forest vegetation in the area is also protected in terms of the Forest Act and the Directorate of Forestry and Water Affairs will certainly express an opinion about the proposed development of the site. The areas of scrub forest are sensitive in terms of the steeper slopes and vegetation type and they should definitely not be directly or indirectly disturbed by the proposed development. Construction on the steeper slopes in forested areas requires innovative attention to the possibility of soil erosion and even land-slipping. This possibility must be clearly mitigated in the planning of the development.

The proposed development layout will not fit into the less sensitive part of the vegetation on the site. The development footprint will thus have to be considerably reduced for it to avoid the more sensitive scrub forest areas (see Figure 3).

3. PROPOSED DEVELOPMENT AND THE SUGGESTED ALTERNATIVE

The development that has been proposed is illustrated in Figure 3.

In the proposed development layout, the portion on the right of the Figure (Eastern end indicated with a red arrow) encroaches on the area of pristine scrub forest. This forest area has been shown to be sensitive and should thus be avoided in the development layout.

3.1 Constraints of the site

The primary constraint is the presence of patches of protected scrub forest on the property. These are pristine forest habitats that should not be impacted by the development. The approximate extent of the scrub forest is shown in Figure 4.

Another constraint is the degree of slope, the steeper slopes presumably being less desirable for development. The scrub forest is associated with steeper slopes so both these sensitivities can be avoided by restricting development to the flattest part of the property. The location of this feature is also shown in Figure 4.

3.2 The most sensible development option (alternative)

The most sensible development option would thus be to:

a) reduce the size of the footprint to fit into the available site
b) restrict the development to the flattest part of the study site
c) completely avoid any direct or indirect impact on the scrub forest
d) preserve the balance of the property for the conservation of fynbos and forest

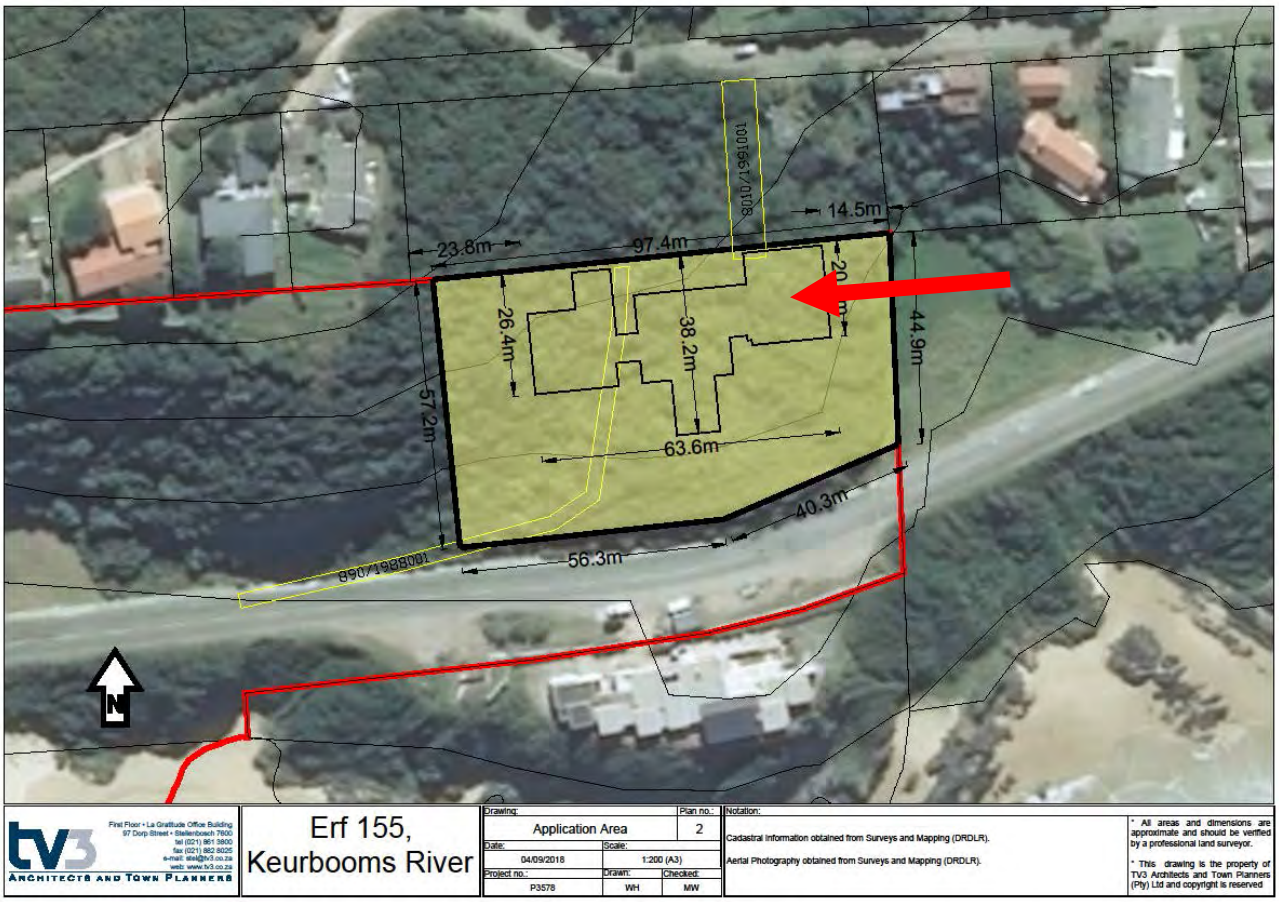


FIGURE 3: Proposed development layout

4. CONCLUSION

The study site contains vegetation that can be described as highly sensitive. Both the former Shale fynbos and the scrub forest are threatened vegetation types and the entire area is classified as a Critical Biodiversity Area. This means that any proposal to develop the site must be done in the most sensitive manner possible.

The originally proposed development layout will have to be reconsidered in terms of the size of the footprint and its positioning, which must be on the flattest part of the property and well clear of the scrub forest areas which should remain completely unaffected by the development, services included.

A fine scale contour map should be used to inform the final placement of the development and the access to it. The scrub forest patches should be clearly demarcated physically and then treated as no go areas. This can be done by fencing it off at two heights with highly visible plastic “danger” tape attached to the trees.

The construction phase must be strictly limited to a demarcated footprint area to ensure that no indigenous vegetation is unnecessarily removed or damaged.

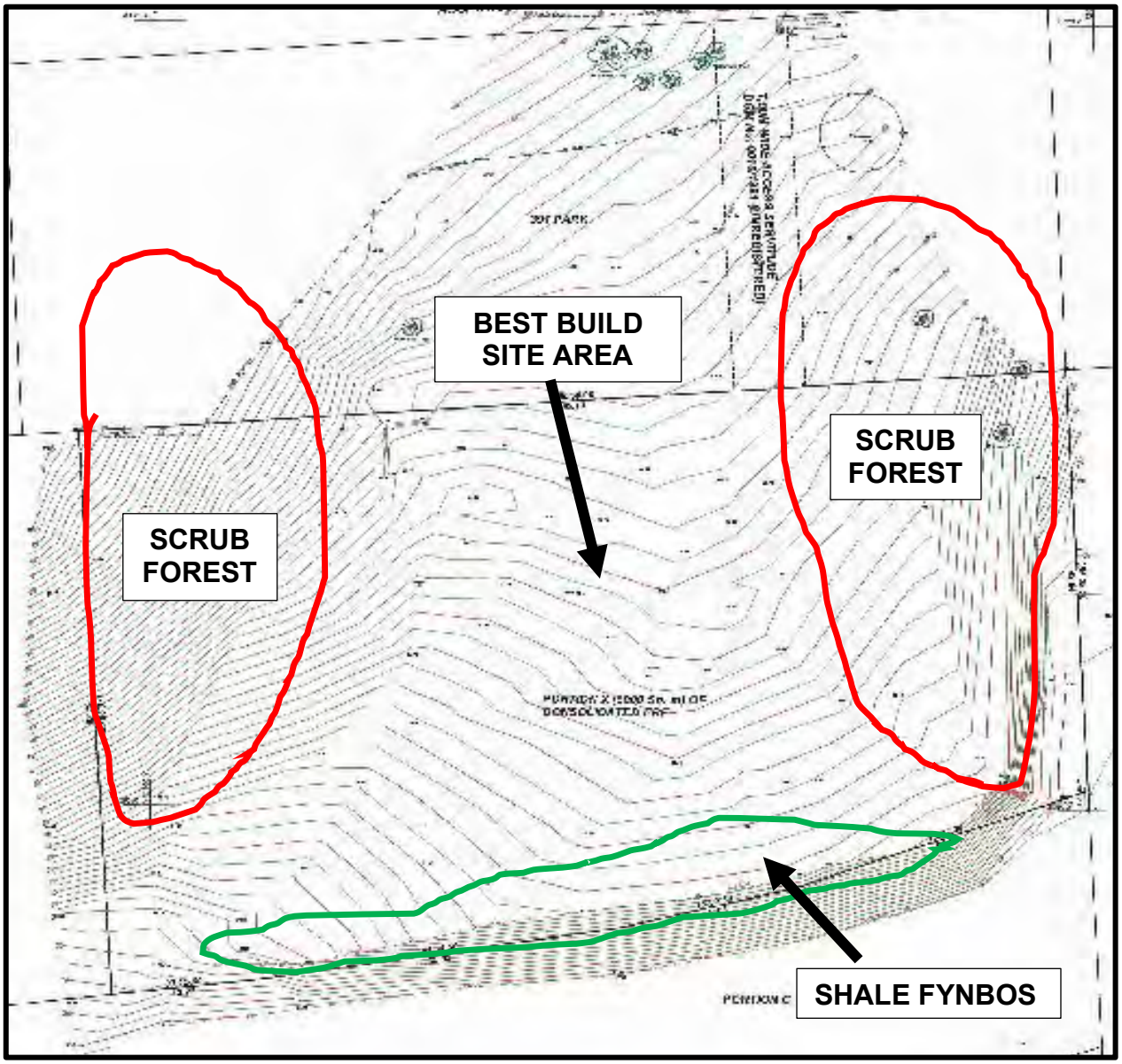


FIGURE 4: Locality of the scrub forest patches and the best locality for development being the flattest area.

5. REFERENCES

Mucina, L & Rutherford, M C. (eds) 2006. The Vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria.

Vlok, JHJ, Euston-Brown DIW, & Wolf T. 2008. A Vegetation Map for the Garden Route Initiative. Unpublished 1:50 000 scale mapping.

Vromans,DC, Maree, KS, Holness S, Job N & Brown AE. 2010. Garden Route Biodiversity Sector Plan for George, Knysna and Bietou Municipalities. Unpublished Garden Route Initiative guideline document.

APPENDIX 1: Location of GPS points recorded during the field survey. Canopy Forest 1,1, Canopy Forest 1,2 and DS3, DS4, DS10 and DS11 are all relevant to the study site.