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CK 2007/043724/23  
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05 December 2013

## AFRICAN GRASS OWL SENSITIVITY SURVEY FOR BLUE HILLS X74

### 1. Background

Pachnoda Consulting was appointed by EKOInfo CC on behalf of LEAP Landscape Architects and Environmental Assessment Practitioners to provide an opinion on the occurrence for African Grass-owls (*Tyto capensis*) on the proposed Blue Hills X74 development (herewith referred to as the "study site"), Blue Hills Agricultural Holdings, Midrand, Gauteng.

A site visit was conducted during 21 May 2013 whereby the study site was inspected. In addition, the study area was subsequently revisited on the 8<sup>th</sup> of November 2013 in the company of community members of the Greater Kyalami Conservancy (GECKO). The purpose of this visit was to investigate a patch of *Imperata cylindrica* grassland on 21 Willow Road that provides nesting habitat for a pair of African Grass-owls for more than eight years.

### 2. Terms of Reference

The terms of reference for this report are to:

- evaluate the *study site* in terms of its suitability to provide habitat for the African Grass-owl (*Tyto capensis*);
- evaluate the *area proximal to the study site* in terms of its suitability to provide habitat for the African Grass-owl (*Tyto capensis*); and
- present a preliminary sensitivity analysis of the proposed development regarding the occurrence of Grass-owl habitat. The analysis is preferential for the conservation and long-term persistence of the "Vulnerable" African Grass-Owl (*Tyto capensis*) and its associated habitat.



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### 3. Limitations and Assumptions

The following limitations were identified for the current opinion report:

- A site visit was conducted on 21 May 2013 which was not optimal for avifaunal surveys as promulgated by the GDARD minimum requirements for biodiversity studies (GDARD, 2012);
- During the November 2013 site visit, the patch of *Imperata cylindrica* on 21 Willow Road property experienced a veld fire (the fire was probably ignited with malicious intention) which flushed and displaced the resident pair of Grass-owls;
- In order to obtain a comprehensive understanding of the dynamics of avifaunal community on the study region, bird assessments should consider investigations at different time scales (across seasons/years) and through replication. Therefore, the current sensitivity analysis provides merely a “snapshot” of the bird community present and are by no means exhaustive since bird distribution patterns fluctuate widely in response to environmental conditions;
- Furthermore, additional information may become known during a later stage of the process or development. This company, the consultants and/or specialist investigators do not accept any responsibility for conclusions, suggestions, limitations and recommendations made in good faith, based on the information presented to them, obtained from the surveys or requests made to them at the time of this report;
- All Grass-owl prescribed buffers are preliminary and were added to apparent wetland edges in the absence of a wetland delineation assessment (to be conducted by a wetland specialist). These buffers are therefore subject to change depending on the outcome of a wetland delineation assessment; and
- *This report provides an opinion regarding the occurrence of Grass-owl on the propose study site. It is not intended to serve as an impact assessment and cannot be used for such purpose until a detailed avifaunal assessment is conducted in the wet season (as per the GDARD minimum requirements).*



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#### 4. Location

The study site is bordered by Summit Road (R 562) in the north, Willow Road in the west and Pitts Road (R 55) in the east, Midrand, Gauteng (Figure 1). The extent of the property is approximately 10.5 ha.

#### 5. Land use and existing surface infrastructure

The study site is vacant and occupied by (degraded) secondary grassland and ornamental trees, including invader tree species (*Eucalyptus camaldulensis* and *Acacia melanoxylon*). The surrounding land use consists of agricultural holdings, equestrian estates and small-scale livestock farming practices. According to the land cover dataset of 2009, a large section of the study site is classified as "degraded" (Figure 2).

#### 5. Surface hydrology

Surface watercourses and drainage lines were absent on the study site although two seasonal (often ill-defined) drainage lines occur 120 m west and 550 m south of the proposed study site. Both drainage lines form part of the upper catchment of the Jukskei River (as part of the Crocodile River catchment) (Figure 3).

#### 6. Description of current habitat

The study site is primarily covered in tall secondary grassland dominated by the graminoids *Hyparrhenia hirta*, *Eragrostis curvula*, *Melinis repens* and *Pogonarthria squarrosa* (Figure 4). Some sections of the study site were formerly occupied by residential (build-up) structures which were subsequently removed and colonised by exotic weed and invader species such as *Bidens pilosa*, *Tagetes minuta* and *Pennisetum clandestinum*. One particular area corresponds to an old French drain system of a derelict homestead and showed a high prominence of facultative hydrophytic vegetation (e.g. *Typha capensis* and *Verbena bonariensis*).



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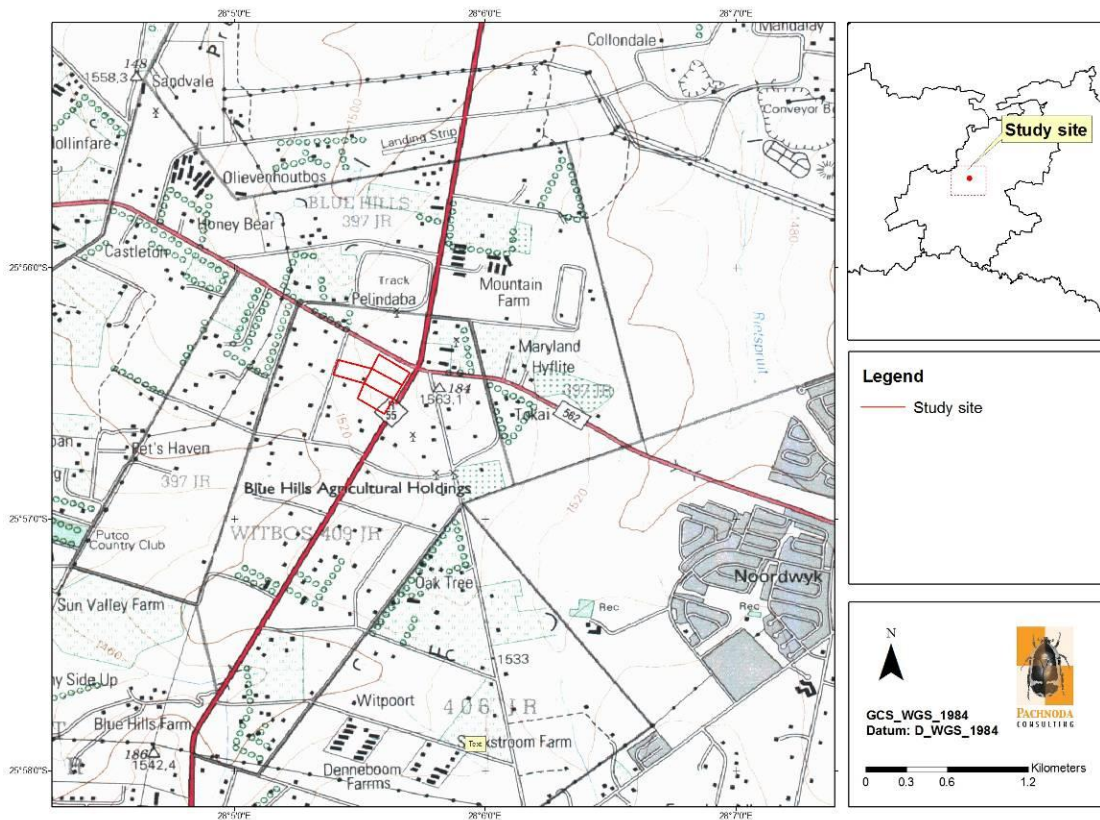
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In summary, the study site is characterised by a floristic structure and composition typical of secondary vegetation. It is evident that the study site is reminiscent of an area that has suffered a long history of anthropogenic perturbation (disturbances).



**Figure 1:** A topocadastral map illustrating the geographic position of the study site.





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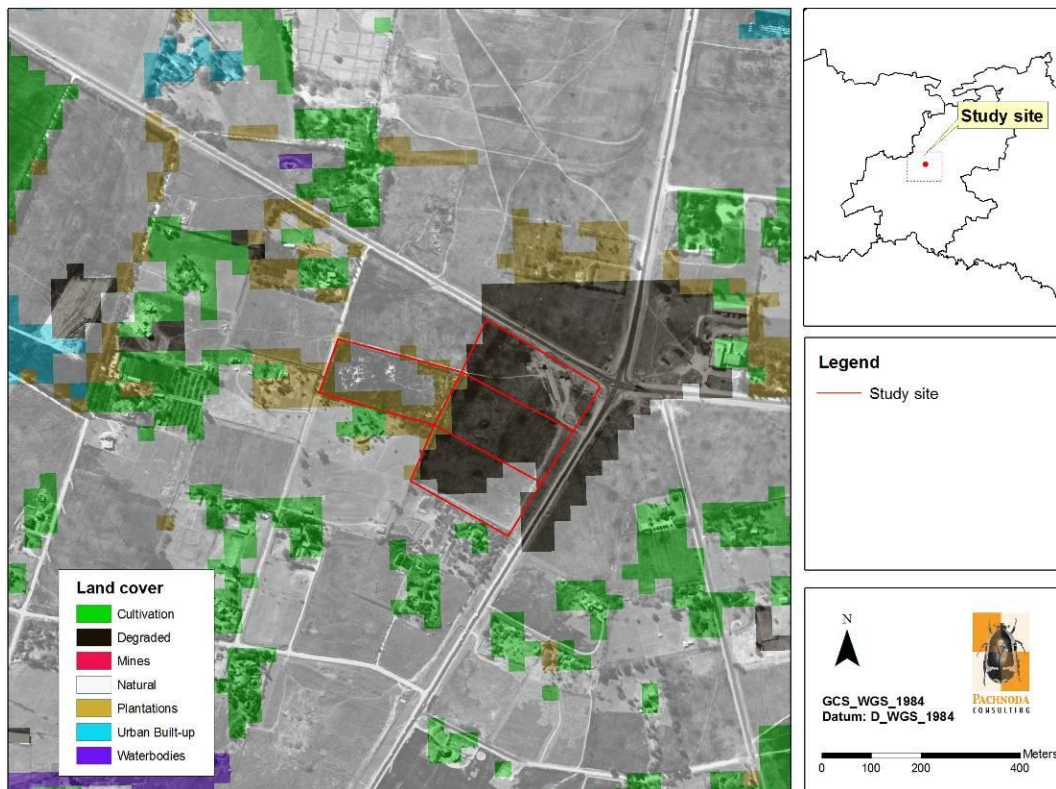
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**Figure 2:** An orthophoto illustrating the land cover on the study site according to the 2009 land cover dataset.



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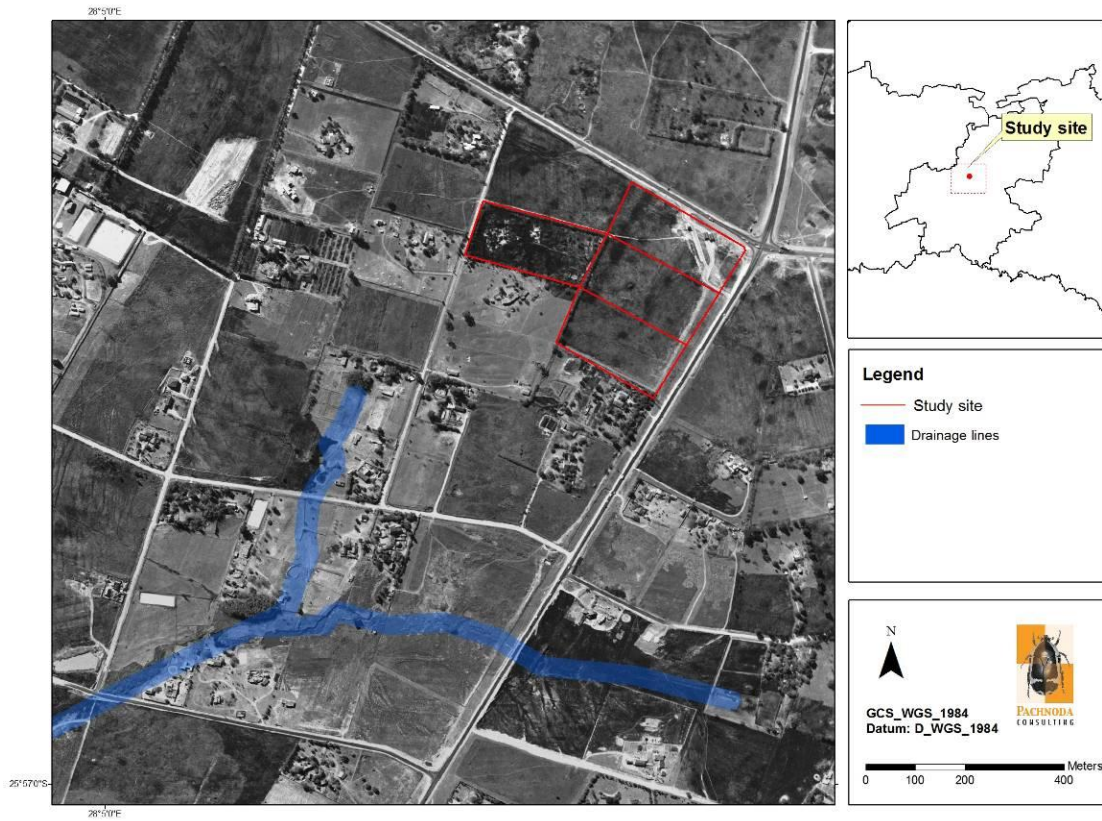
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**Figure 3:** An orthophoto illustrating the surface hydrology in the vicinity of the study site.





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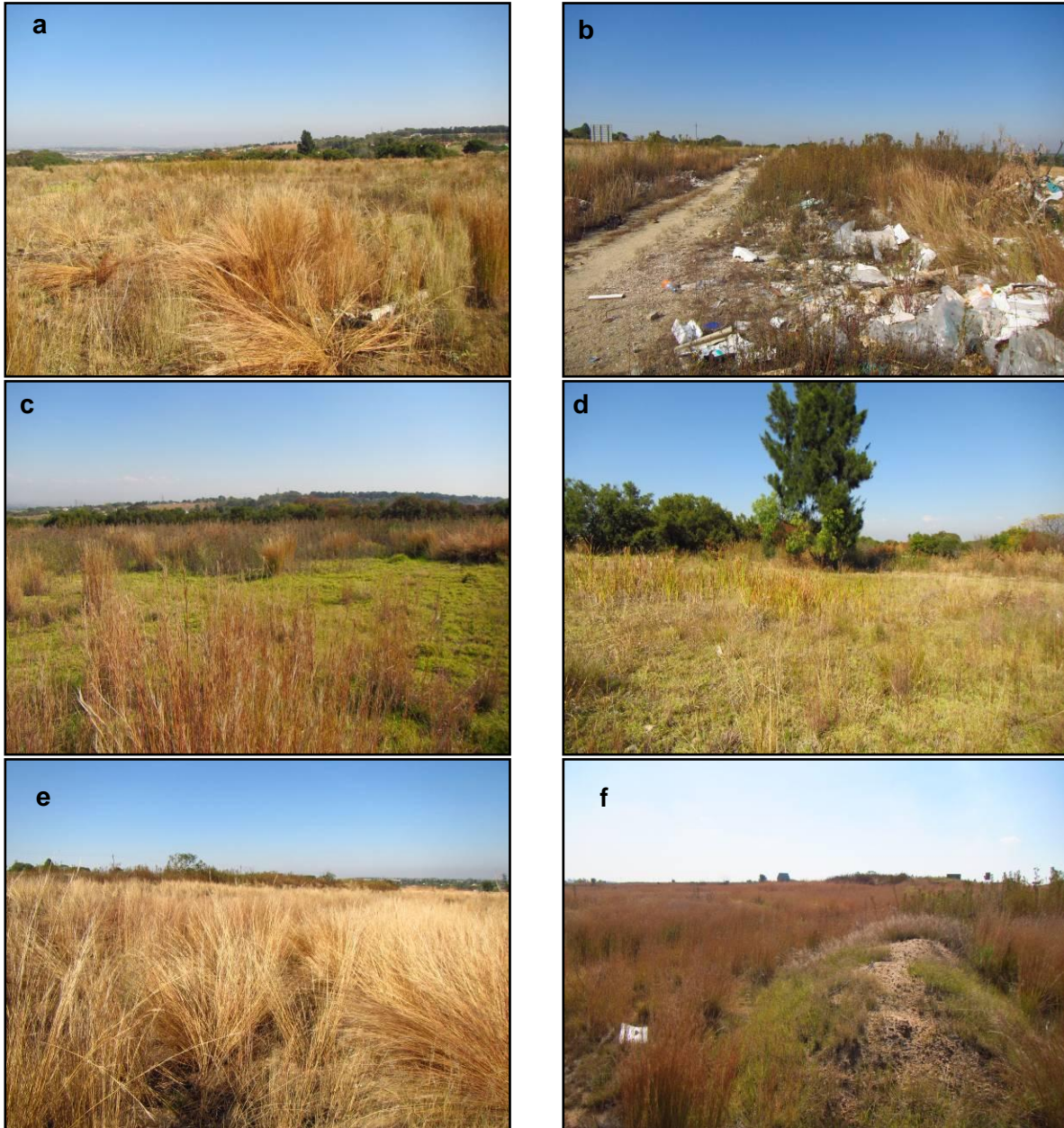
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**Figure 4:** The dominant vegetation and its associated floristic structure observed on the study site.



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## 7. The African Grass-owl (*Tyto capensis*)

The African Grass-owl is categorised as “Vulnerable” in the National Red Data book of Birds (Barnes, 2000) of which the southern African population is estimated to be less than 5 000 individuals. It is a secretive and strictly nocturnal species that is seldom seen unless flushed from its daytime roosting site or nest (Kemp, 2005).

It is often possible that the Marsh Owl (*Asio capensis*) could be mistaken for a Grass-owl since both species share the same type of habitat. Grass-owls are more often outnumbered (10:1) by Marsh Owls, and it is not unlikely that some observers could confuse the two species with each other (Tarboton *et al.*, 1987). In addition, both species have similarly structured roosting sites, thereby complicating identification. Grass-owls and Marsh Owls will often use the same habitat to breed, although the former always utilise dry or damp areas and not areas that are placed over water (Tarboton, 2001). In addition, Grass-owls nearly always construct a “tunnel system” within rank grass that differs from Marsh Owl nests (see Figure 5).

### 7.1 Typical habitat requirements

The occurrence of African Grass-owls depends on four important factors and includes the following:

- The graminoid layer should be dense enough for individuals to roost and breed while protecting them from potential predators. Grass-owls prefer the densest vegetation during breeding and roosting;
- The height (or structure) of the grassy layer should exceed 750 mm in length to facilitate the construction of their diagnostic system of tunnels (nests). If < 750 mm, the grassy layer should be densely intertwined by members of the Cyperaceae;
- Typical roosting and breeding habitat must not be regularly burned or grazed, and should preferably be left unburned or grazed for at least two years at a time to allow the grass to recover; and





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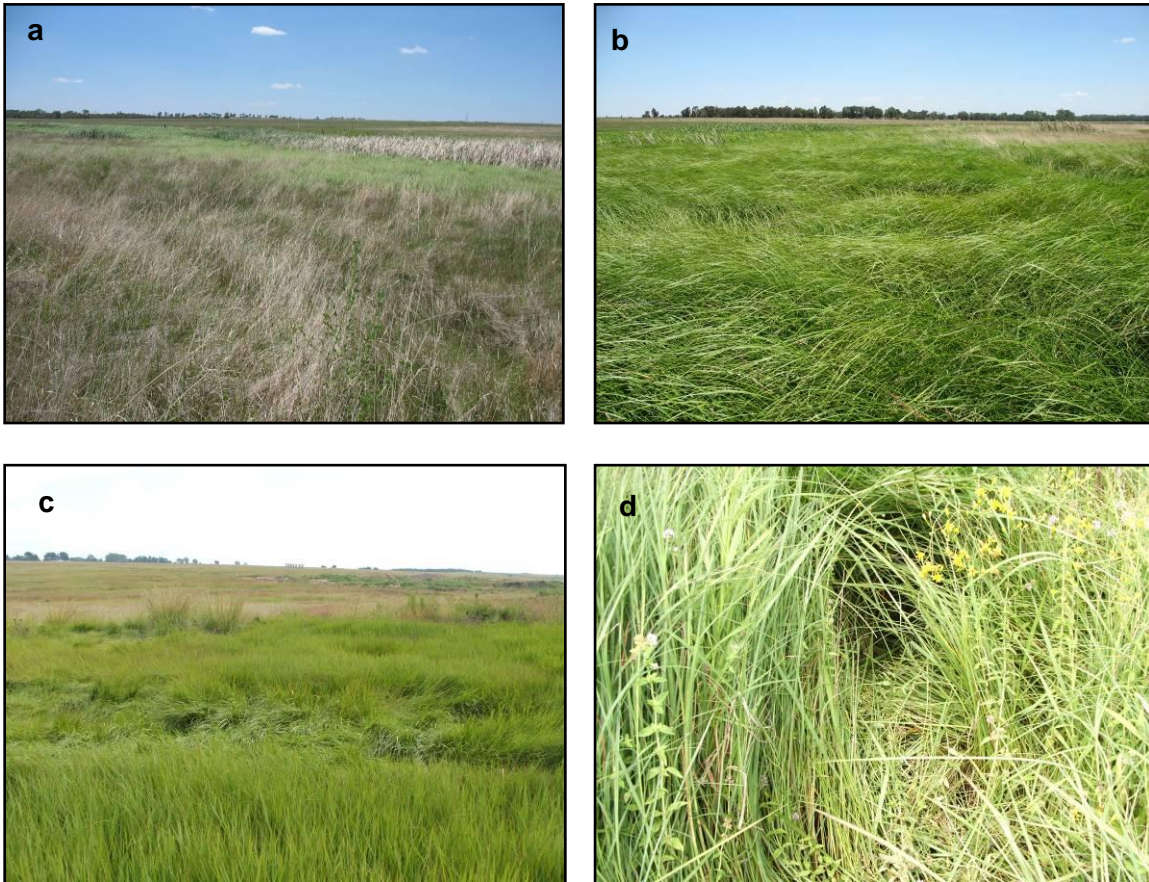
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- Suitable foraging habitat (e.g. open grassland and fallow land) should be accessible and preferably located in close proximity to roosting and foraging habitat.



**Figure 5:** Typical breeding and roosting habitat of the African Grass-owl (*Tyto capensis*): (a) dense patches of *Arundinella nepalensis* and (b) tall, dense *Carex* sp. along the edge of a highveld seep. (c) An example of tall *Imperata cylindrica* grassland after the rainy season, which is suitable for the construction of (d) nest sites (All photographs were taken elsewhere in Gauteng, and were included for information purposes only).



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### 7.2 The occurrence of the African Grass-owl (*T. capensis*) on the study site

The study site does not provide suitable conditions for Grass-owls to breed or roost, although it provides ephemeral foraging habitat depending on the quality of the surrounding grassland (e.g. should suitable habitat adjacent to the study site be burned). However, the condition of the grassland sere on the study site is considered less suitable when compared to the grassland seres in the region (see Figure 6), thereby rendering the occurrence of Grass-owls on the study site as irregular/uncommon (although their occurrence could not be interpreted as absent).

The irregular occurrence of Grass-owls on the study site is further explained by the absence of any recent observations in the area (according to SABAP2: 2555\_2805) and by the low reporting rates (c. 2 %) during the previous atlas period for the quarter degree grid square that is sympatric to the study site (2528CC; Harrison *et al.*, 1997).

### 7.3 The occurrence of the African Grass-owl (*T. capensis*) in the study region

From a landscape perspective it is evident that suitable breeding, roosting and foraging habitat are present along the two drainage lines located west and south of the study site (Figure 6). In addition, a pair of Grass-owls was also recorded from a patch of *Imperata cylindrica* grassland (on 21 Willow Road) corresponding to a seasonal drainage line west of the study site (see Figure 7 & Figure 8). Unfortunately, this particular area of suitable breeding habitat was burned during a recent site visit (November 2013; Figure 6) which subsequently displaced a pair of Grass-owls from the property (pers. obs.).

Both these drainage systems are at risk from ongoing urban development and subsequent fragmentation. Any additional hard surfaced development in the upper catchment of these systems could increase the potential for surface water run-off, thereby resulting in predicted modification of the vegetation composition and structure along the drainage lines. For example, an increased volume of surface run-off (due to an increased volume of hard surface and decreased infiltration rates) could alter/modify the *Imperata*-dominated grassland to a *Cyperoid*- and *Phragmites*- dominated system which will eventually render the area unsuitable for Grass-owls to utilise. Both systems





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encompass critical important breeding habitat composed of dense *Imperata cylindrica* with the probability to sustain at least one to two breeding pairs of Grass-owls. However these specialised habitat types (referring to the patches of *Imperata cylindrica* grassland) are highly localised and fragmented in the region. One of these patches provides optimal breeding habitat (see red arrow in Figure 8) and another sub-optimal breeding and roosting habitat (due to fragmentation and structure; see black arrow in Figure 8) - both areas are located in close proximity to the proposed study site. **Any planned development within the area should acknowledge the recommended buffer of 170 m which should be considered as sensitive.**





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**Figure 6:** (a-b) *Imperata cylindrica* grassland - potential suitable breeding habitat on the study area for African Grass-owls (*T. capensis*) and (c-d) suitable foraging habitat along one of the drainage lines in the study area.



**Figure 7:** A collage of images showing a pair of African Grass-owls (*Tyto capensis*) being flushed and displaced from their breeding habitat during a raging veld fire on the property of 21 Willow Road (08 November 2013). The property is in close proximity to the proposed study site that is earmarked for development. Photographs courtesy (and copyright) of Tyrone McKendery.





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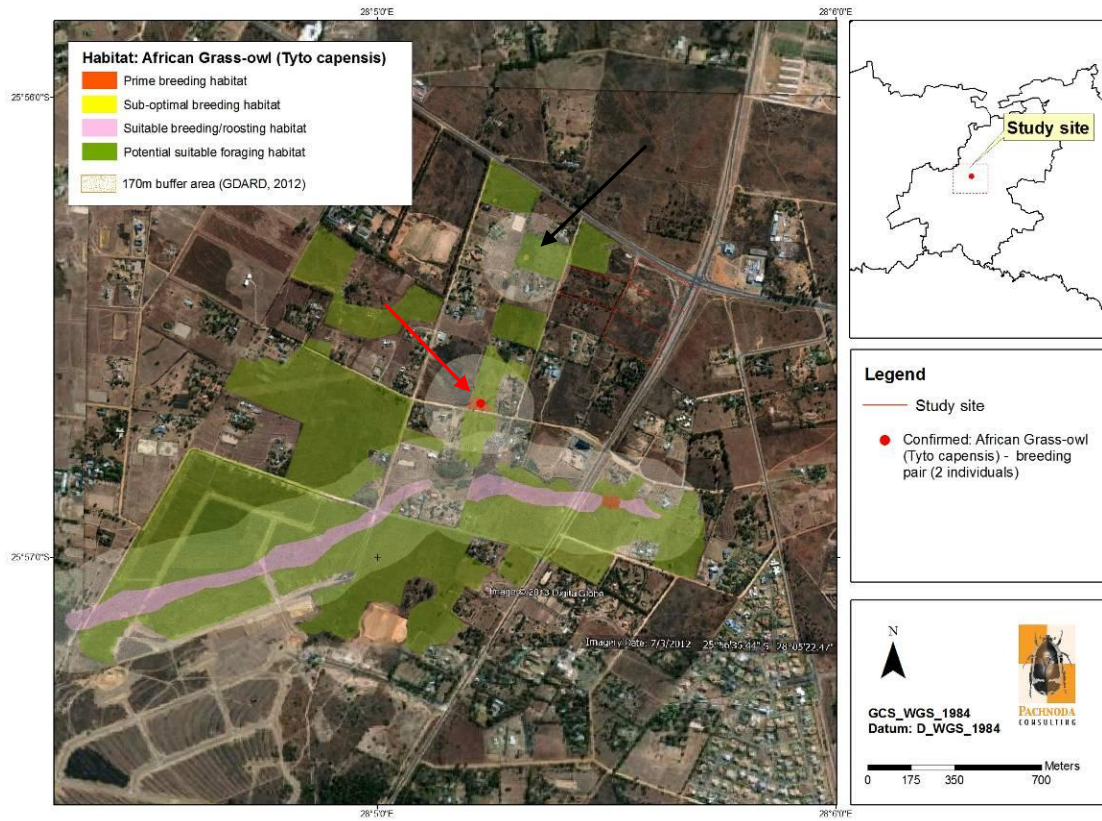
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**Figure 8:** A regional map indicating the suitability of the study area for the occurrence of African Grass-owls (*Tyto capensis*) south of Summit Road (R 562) based on the GDARD minimum requirements (satellite image courtesy of GoogleEarth). Note the confirmed presence of African Grass-owls on property 21 Willow Road (red arrow).



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## 8. Preliminary Sensitivity Guidelines: Regional Approach

### 8.1 *The Gauteng Minimum Requirements for Biodiversity Assessments*

The following minimum requirements should be adhered to for any wetland system/drainage line in Gauteng that consists of suitable breeding and roosting habitat for the occurrence of the African Grass-Owl (GDARD, 2012):

- All suitable habitat (breeding and roosting habitat) should be buffered by 170 m from the edge of the wetland zone;
- All suitable habitat (breeding and roosting habitat) should be envisaged as sensitive and must be conserved;
- An additional 100 ha (or more) of suitable habitat should be demarcated adjacent to the breeding and roosting habitat. The specific surface area, being 100 ha or more is deemed necessary for the long-term persistence of any residing owl population.

The importance of a buffer zone is to minimise any edge effects that could potentially impact on the habitat quality of the Grass-Owl habitat. In general, habitat fragmentation results in an increase in the proportion of edge effects in relation to the total area. Edges are habitat areas that are often unsuitable for some species to utilise, which subsequently becomes confined to an even smaller interior or core area of unchanged habitat.

### 8.2 *The Gauteng Minimum Requirements for Biodiversity Assessments*

Figure 8 shows a preliminary sensitivity map demonstrating two drainage lines west and south of the study site. The former provides breeding habitat for a resident pair of Grass-owls along with sub-optimal breeding habitat to the north, while the latter also provides optimal breeding and roosting habitat for Grass-owls. Both areas were subsequently buffered by the prescribed 170 m (Figure 6) buffer zone. In addition, Figure 8 represents a regional habitat map representing potential breeding, roosting and suitable foraging habitat of approximately 141.38 ha in total (see Table 1).



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**Table 1:** The calculated surface areas of breeding, roosting and suitable foraging habitat for Grass-Owls in the study area as illustrated in Figure 8 (please note that these figures are all approximated and subject to change depending the outcome of a wetland delineation assessment).

Habitat	Hectares (ha)
Optimal roosting & breeding habitat	0.65
Sub-optimal breeding habitat	0.04
Potential suitable breeding & roosting habitat	14.33
Suitable foraging habitat	126.36
<b>Total</b>	<b>141.38</b>

Any development coinciding with the two drainage lines will decidedly impact on Grass-owl individuals that could utilise these systems during foraging, breeding and roosting. It is therefore recommended that these areas be excluded from future development. A precautionary approach should be utilised during any activity in the area which could impact on suitable breeding, roosting and foraging habitat, while specific reference should be made towards storm water run-off design and maintenance which could alter/modify the Grass-owl habitat in the long term, thereby resulting in the displacement of this species from the area.

## 9. Recommendations

It is highly recommended that the following studies/assessments be conducted:

- A detailed *avifaunal study* in the wet season once the vegetation has recovered from winter fires. The study should strive to identify potential Grass-owl breeding habitat (in addition to those mentioned in the report) and to identify terrestrial ecosystems with high avifaunal diversities in the *region*. In addition, specific emphasis should be placed on delineating Grass-owl habitat (breeding and roosting habitat) along the drainage system that traverses the Blue Hill Equestrian Estate development;
- A detailed wetland delineation to guide the Grass-owl assessment and sensitivity mapping;



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- A proper storm water and flood model to predict the effect/rate of unnatural surface run-off into nearby drainage lines due to the proposed development.

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