



Rhodes Restoration Research Group *in association with* Regalis Environmental Services

Baviaanskloof Subtropical Thicket Restoration

Western Baviaanskloof Private Lands

SPATIAL RESTORATION PLAN

and initial carbon credit feasibility study

Prepared for the **Living Lands**

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1. Introduction

The pilot **Subtropical Thicket Rehabilitation Project** was commissioned in 2004 by the Department of Water Affairs and Forestry (**DWAF**), with the focus on carbon sequestration ([Powell et al. 2004, 2006](#)) and carbon credits that could ultimately fund large scale restoration of degraded subtropical thickets ([Mills et al. 2003, 2007, CAP 2009](#)). Subsequently the pilot project grew and became known as the Subtropical Thicket Restoration Programme (**STRP**), a subsidiary of the Working-for-Woodlands Programme. A large number of people and resources have been involved in building the social, scientific and business case ([CAP 2009](#)) for the STRP and ultimately to build the platform for a Payment for Ecosystem Services, **PES**, ([Marais et al. 2009](#)) within the Albany Thicket Biome ([Hoare et al. 2006](#)).

It was always a premise of the STRP that the program was to “kick-start” a massive landscape restoration initiative on private land. A key prerequisite to attaining carbon credits is to commission or complete a Project Design Document (**PDD**) in the compliance sector (CDM and Kyoto) or a Project Document (**PD**) in the voluntary sector. The establishment of carbon stock baselines as well as commissioning social assessments or stakeholder analyses are embedded in both **PDDs** and **PDs**. To attain either formal or voluntary carbon credits the methodologies within the **PDDs** or **PDs** will require a process of validation. Contingent on approval of the methodologies/monitoring programmes, as well as successful establishment and growth of spekboom, a process of certification is required by internationally appointed consulting companies. Typically certification processes will be required a number of times during the project (30 yrs+). All the above process procedures and red tape amount to a vast amount of “school fees” or transaction costs (typically R500k - R800k). Currently the **STRP** has commissioned a PDD ([Mills et al. 2010](#)) which excludes the private farms in the project area, which implies that these transaction costs would need to be incorporated into a funding model.



The collective body of facilitated research in the study area and consultation through the **PRESENCE** network (www.earthcollective.net//initiatives/presence) The Working-for-Woodlands Programme (www.dwa.gov.za/wfw), the **Water for Food and Ecosystems Programme** (Jansen 2008), and specifically the **Living Lands** (www.earthcollective.net/livinglands) group has created the platform for a profound and historic change in land use. Landowners and stakeholders finally appreciate the true value of watershed services (De Paoli 2008). The restoration of the degraded subtropical thickets is a critical aspect to the retention of topsoil and hence watershed services. The ecosystem goods and services (EGS) that farmers receive have been shown to accrue at around 50-60% from subtropical thicket vegetation (De la Flor Tejero 2008.) It stands to reason that to achieve optimally sustainable rural livelihoods and keep people “living on the landscape” – restoration of the degraded areas should be seen as a priority. Initial assessments regarding the institutional possibilities surrounding the attainment of carbon credits through STRP and the Baviaanskloof appeared favourable, but recommendations were made for the bundling of PES (Lorencová, 2008).

The recent PES feasibility study (Mander et al. 2010), supports the concept of restoring the subtropical thicket areas with a view to retaining EGS. Despite the significant costs for the revegetation of the degraded areas – positive cost : benefit ratios are reported and overall net income (EGS) is in the range R105 per ha per year (Mander et al. 2010).

The concept of “designer” ecosystems (Mills et al. 2007, Mander et al. 2010 citing Palmer et al. 2004), with “hyper-beneficial” thicket with higher concentration of species for forage, medicinal plants and threatened species should not be undertaken within a world heritage site without a proper environmental impact assessment. The precautionary principle should apply. The same applies to super saturating the landscape with *P. afra* cuttings. Furthermore restoration activities that occur within a protected area or within 10 kilometres of a protected area may require the commissioning of an EIA process (DEA 2010).

2. Study area

As per terms of reference in the request to tender document, received 29/7/2010, the study area has been defined as the properties that are currently free-hold title, occur in the Baviaanskloof River Valley between Koleskeplaas and Nuwekloof as outlined in Figure 1. A total of 88 individual properties (~46 500 ha's), with 27 separate landowners has been identified. Individual erf's/farm portion sizes ranged from 0.4 ha's to 9886.8 ha's, but a number of landowners have numerous portions. (see Table 6)

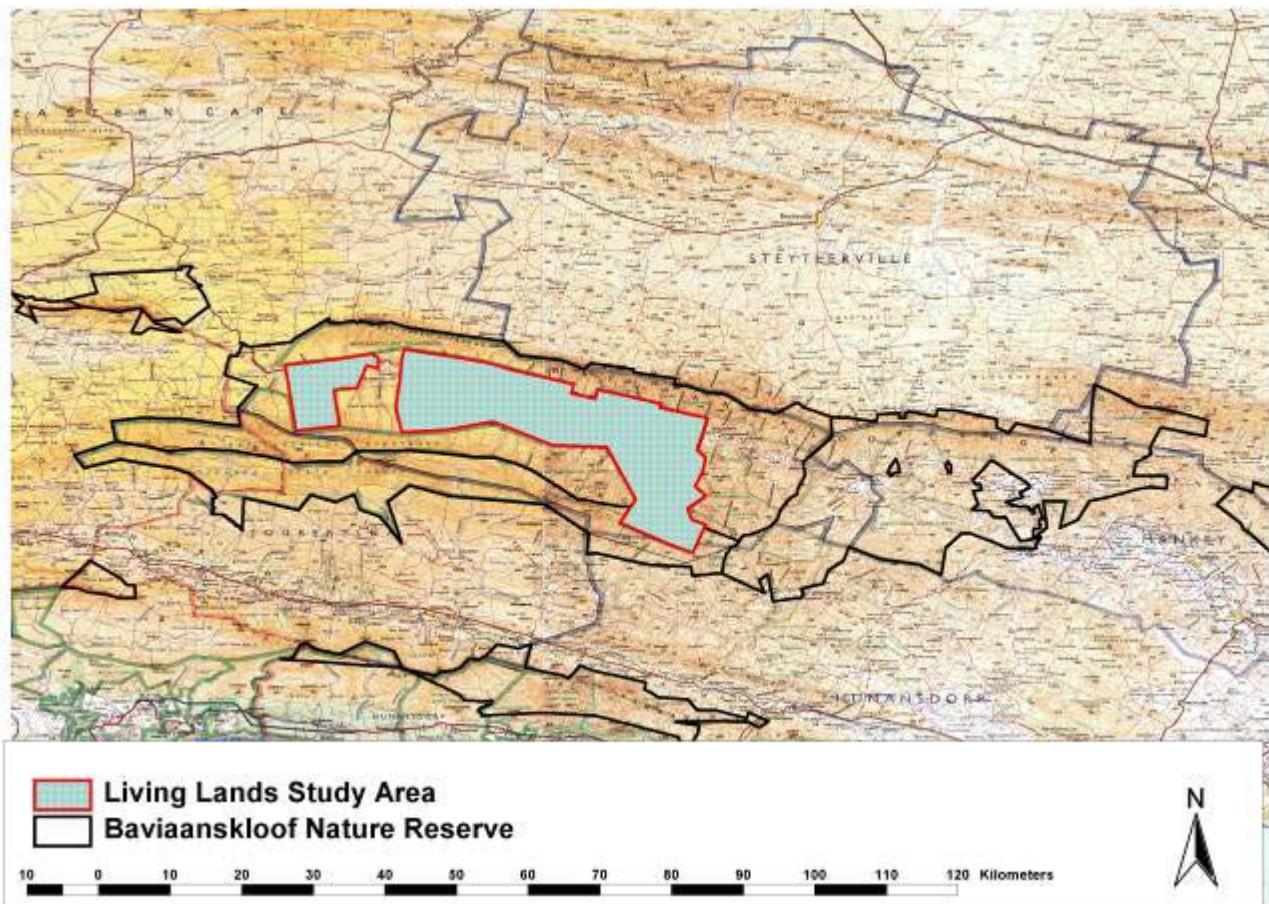


Figure 1: Study area in relation to the Baviaanskloof Nature Reserve

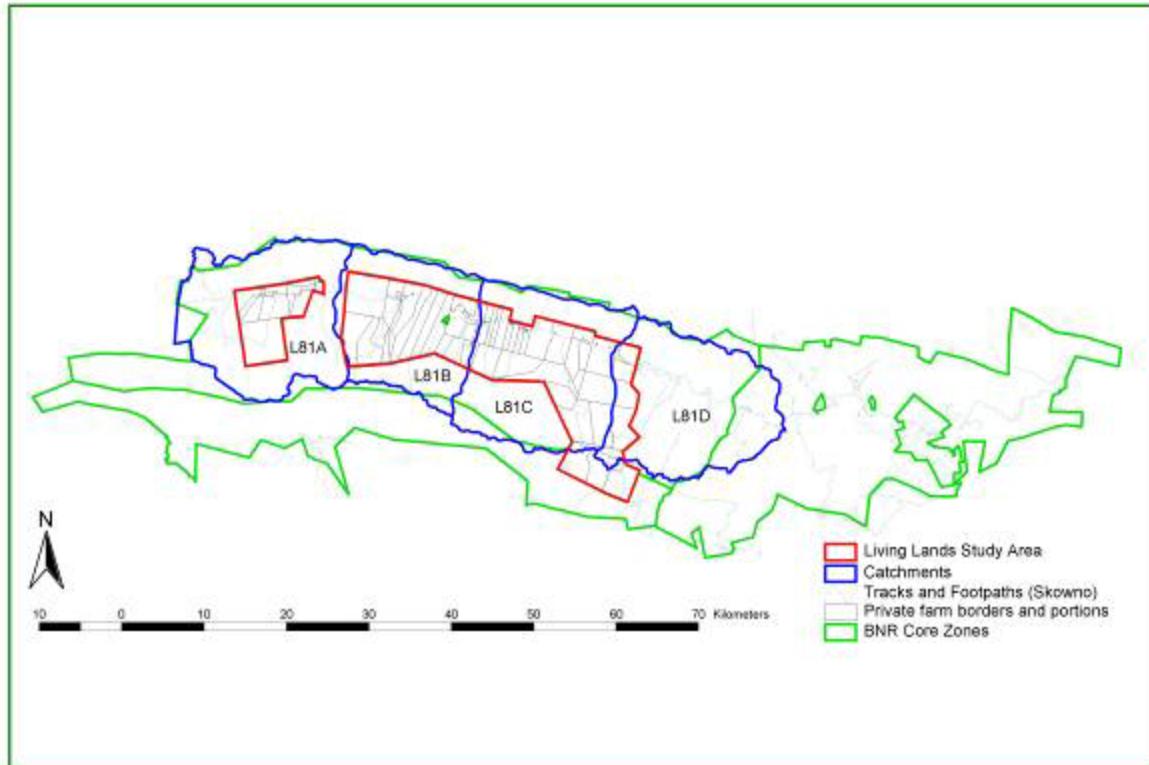


Figure 2: Locality map for the study area in relation to the Baviaanskloof Nature Reserve and catchment boundaries.

The rainfall for the area shows a N-S gradient with the lower lying areas receiving 300-400mm pa, while the top mountain slopes receive ~800-1 000mm pa. Altitude ranges from 100 masl to 1 600 masl, with water draining to the ESE. The valley floor at the top of the catchment (L81A) is around 800 masl and the lower end (L81D) ha's a height of 100 masl. The altitudinal gradient brings a temperature and frost gradient with the western end experiencing mean colder temperatures and more frequent and heavier frosts.

2.1 Vegetation Classification

Vegetation classification as well as degradation mapping, are crucial components of the carbon feasibility assessment. The appraisal of previous datasets is outlined below to allow for comparisons with [Vlok's \(2010\)](#) findings.



[Acocks \(1975\)](#) described the valley vegetation that was rich in spekboom and restricted to catchments L81B, C and D as **Succulent Mountain Scrub** or **Spekboomveld**. The higher altitudes were called **False Macchia** (fynbos), while the dry valley vegetation of catchment L81A was described as **Karroid Broken Veld**. [Low & Rebelo \(2006\)](#); provided a poor reflection of the vegetation within the Baviaanskloof (citing the area as mostly **Grassy Fynbos**, with a limited amount of **Mountain Fynbos**). The outcomes of the STEP Programme ([Vlok & Euston-Brown 2002](#), [Lloyd et al. 2002](#), [Lombard et al. 2002](#), and [Vlok et al. 2003](#)) provided the first accurate reflections of the vegetation complexity and degree of degradation for the Baviaanskloof area.

STEP vegetation classification for the study area estimated that approximately 13 200 ha's can be described as spekboom rich. A further 2 460 ha's have some spekboom cover but at much lower densities.

Table 1. STEP Vegetation classes and extent for the study area ([Vlok et al. 2003](#))

Vegetation Class	Ha's
Baviaans Doringveld	3 323.5
Baviaans Fynbos Thicket	330.9
Baviaans Renoster Thicket	6 763.9
Baviaans Spekboom Thicket	10 230.8
Baviaans Valley Thicket	2 460.0
Baviaans Mountain Fynbos Complex	18 167.8
Groot Arid Spekboomveld	3 004.8
Kouga Mountain Fynbos Complex	2 303.8

The most recent and spatially accurate vegetation classification that is currently available was commissioned by the Wilderness Foundation as part of the Baviaanskloof MegaReserve Project ([Euston-Brown 2006](#)). According to these data a total of 13 409 ha's was historically rich in spekboom (Table 1), equating to approximately 29.4% of the total area.



Table 2. Vegetation classes and extent for the study area according to Euston-Brown 2006).

Vegetation Class	Ha's
<i>Baviaanskloof Afromontane Forest</i>	4.1
<i>Baviaanskloof Renoster Sandolienveld</i>	5 837.8
<i>Baviaanskloof Sandolienveld</i>	2 142.7
Baviaanskloof Spekboom Thicket	10 861.0
<i>Baviaanskloof Subtropical Forest</i>	370.4
<i>Baviaanskloof Temperate Forest</i>	92.9
<i>Baviaanskloof Temperate Thicket</i>	1 300.4
<i>Baviaanskloof Thicket Savanna</i>	2 635.6
Groot Arid Spekboomveld	2 547.8
<i>Groot Woodland</i>	1 943.6
<i>Kouga Arid Fynbos</i>	6 748.6
<i>Kouga Asbos Renosterveld</i>	1 363.2
<i>Kouga Grassy Fynbos</i>	5 345.6
<i>Kouga Mesic Fynbos</i>	3 792.9
<i>Kouga Restioid Fynbos</i>	102.8
<i>Nuwekloof Fynbos Woodland</i>	485.8
TOTAL	45 575.2

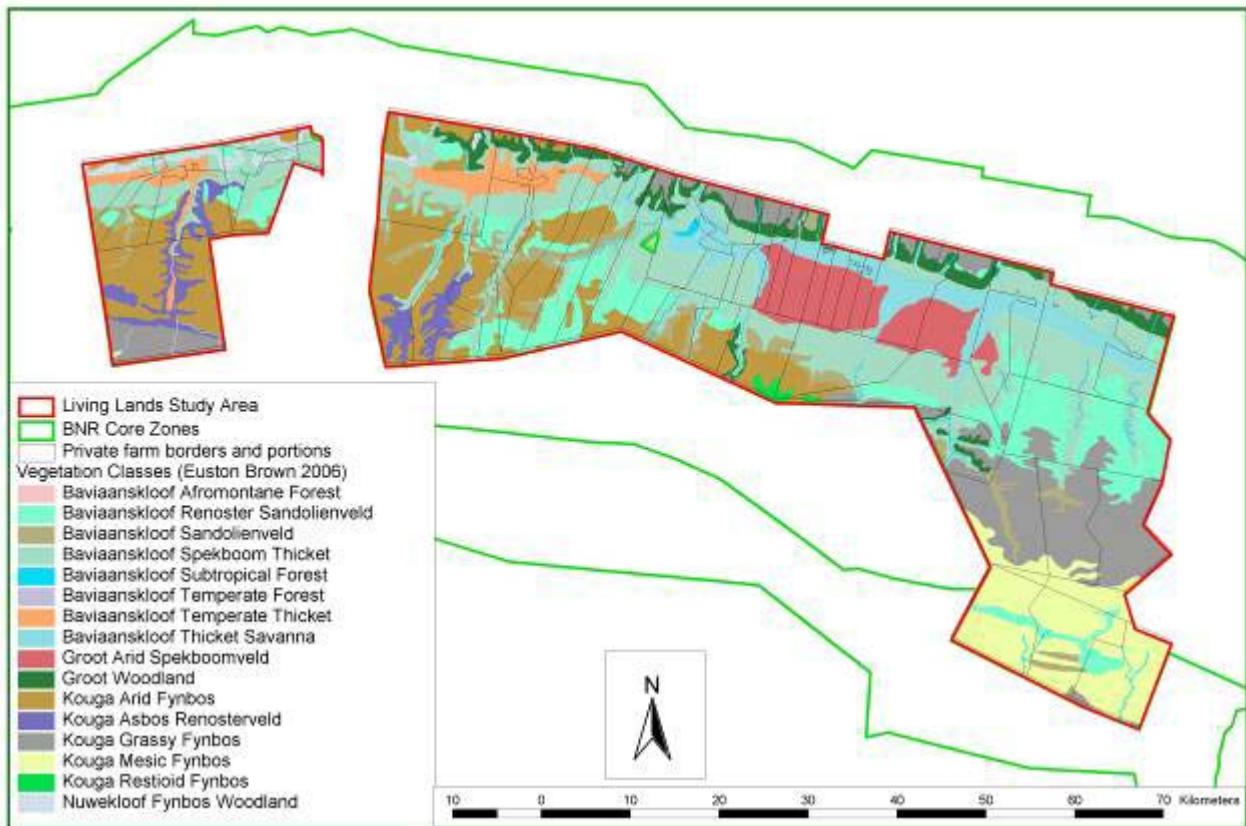


Figure 3. Study area vegetation according to Euston Brown (2006)

2.2 Vegetation Degradation

A closer look at two previous studies that quantified the degradation will provide some measure of confidence to the results presented below (section 5.1). The spatial configuration for the two studies ([Lloyd et al. 2002](#) and [Euston-Brown et al. 2006](#)) (Figures 4 & 5), differ slightly but the core of the degradation is located in the middle of the valley where spekboom % cover was historically high.

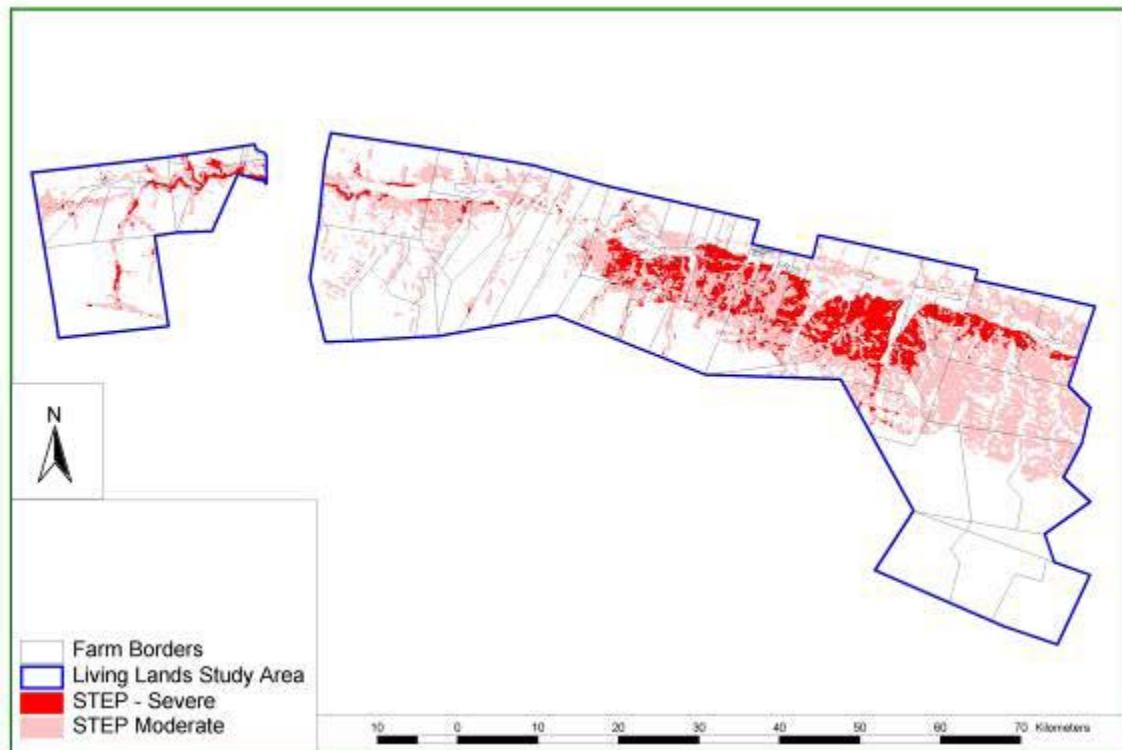


Figure 4. Study area vegetation degradation according to Lombard *et al.* (2002).

The vegetation degradation statistics are difficult to compare due to slightly different classification systems (Table 3). It is interesting to note that Euston-Brown records no pristine or near-pristine subtropical thicket in the study area. In summary the STEP data estimates approximately 11 000 ha's, whereas Euston-Brown estimates nearly 15 000 hectares. Given the methodologies employed and the scale of mapping, it is Euston-Brown's estimates are likely to be more accurate.

Table 3. Summary statistics for the STEP degradation mapping ([Lloyd et al. 2002](#), [Lombard et al. 2002](#)) for the [Vlok et al. \(2003\)](#) subtropical thicket vegetation classes.

Sources	Severe (5)	Heavy (4)	Moderate (3)	Good (2)	Pristine (1)
STEP (Lloyd et al. 2002)*	3 223.5	0	7 612.3	?	?
Euston-Brown (2006)**	2 547.7	12 187.4	59.8	0	0

* STEP mapping methodology ([Vlok et al. 2003](#)) incorporated thicket and thicket mosaics (total 26 113.9 ha's). When focussing on the "solid" thickets only, the study area has 15 695.6 ha's.

** 1: pristine; 2: still in good condition but showing signs of having been over burnt and or overgrazed; 3: partially degraded through overgrazing and over burning; 4: heavily degraded as a result of too frequent burning and overgrazing to the extent that local extinction has occurred; 5: severely degraded ([Euston-Brown 2006](#)).

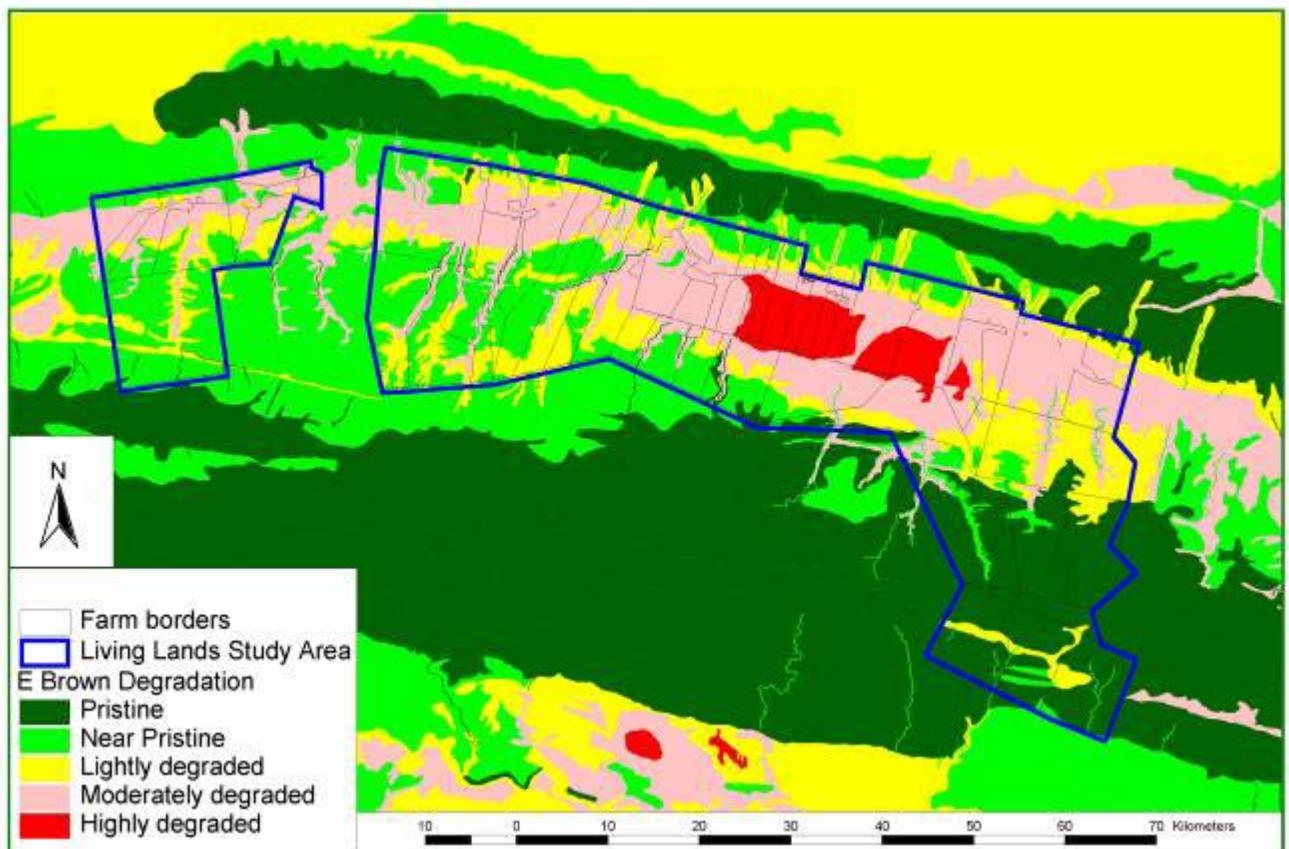


Figure 5. Study area vegetation degradation according to Euston Brown (2006).

The STEP data can further be subdivided into 3 vegetation classes with the associated degradation levels. [Lloyd et al. \(2002\)](#) contends that moderate degradation is partitioned



accordingly **Baviaans Spekboom Thicket** (4 989.9 ha's) **Baviaanskloof Valley Thicket** (1 419.5 ha's) and **Groot Arid Spekboomveld** (1 293.8 ha's). Severe degradation is restricted to **Baviaans Spekboom Thicket** (1 633.7 ha's) and **Groot Arid Spekboomveld** (1 589.8 ha's) [Lloyd et al. \(2002\)](#).

Table 4 : Summary of degradation hectares per property from STEP data ([Lombard et al. 2002](#)).

OWNER	Moderate (ha's)	Severe (ha's)	TOTAL
BIDDULPH	71.28	3.75	75.03
CONGREGATIONAL CHURCH - WILLOWMORE	3.84	2.06	5.90
CREATIVE FUTURES COMMUNITY TRUST	123.75	68.54	192.29
DREAM WORLD INV 127 PTY LTD	59.24	37.83	97.07
DU PREEZ	68.02	47.52	115.54
DU PREEZ FAMILY TRUST	83.49	8.58	92.07
EDUCATIONAL TRUSTEES	0.35	0.00	0.35
ERJEE TRUST	205.71	0.00	205.71
HONEY	338.78	20.57	359.35
INITIATIVE S A INV 71 PTY LTD	623.13	263.16	886.29
LAMPRECHT - TRUSTEES	2 325.79	1 521.75	3 847.54
LEZMIN 2087 C C	157.12	35.18	192.30
NEDERDUITS GEREREFORMEDE KERK	1.31	0.00	1.31
NORTJE	65.64	0.00	65.64
NOT IN DEEDSWEB	1.02	0.00	1.02
REYNEKE	67.03	3.31	70.34
ROOIKLOOF C C	185.18	62.85	248.03
SEWFONTEIN GEMEENSKAPSBOERDERY TRUST	403.40	163.45	566.85
SMITH D	343.38	312.7	656.1
SMITH N	91.9	1.73	93.6
TERBLANCHE	215.29	51.19	266.48
UNITED CONGREGATIONAL CHURCH SA	21.69	0.69	22.38
VAN DER WAT	84.36	5.22	89.58
VAN RENSBURG MG	304.2	237.12	541.3
VAN RENSBURG RJ	853.5	113.6	967.1
VORSTER	99.09	50.96	150.05
ZANDVLAKTE BOERDERY TRUST	814.65	211.68	1 026.33
TOTALS	7 612.24	3 223.47	10 835.71



3. Purpose of Study:

- (i) To identify all the potential sites in which Spekboom (*Portulacaria afra*) occurs within the private properties of the western kloof, Baviaanskloof.
- (ii) To provide estimates for potential carbon credits for the study area collectively for a period of 10, 20 and 30 years.
- (iii) To provide estimates for potential carbon credits for the individual farms respectively, 10, 20 and 30 years.
- (iv) To provide a GIS database and map of the restoration potential

4. Methods:

- (i) Vegetation types in which Spekboom occurred historically were identified and densities (% cover) were estimated per hectare.
- (ii) Spekboom vegetation types were mapped onto hardcopy maps and captured into ARCVIEW 3.3 GIS database.
- (iii) Four levels of degradation were used to stratify the spekboom vegetation: pristine-moderate, moderate, moderate-severe and severe degradation. The degree of transformation/degradation is indicated as follows: Severe (<20% of original Spekboom densities remaining); Moderate (20-50% of original Spekboom densities remaining) and Pristine (50-100% of original Spekboom densities remaining).
- (iv) Using GIS the spatial data was summarised according to degradation levels and spekboom % cover
- (v) Using a simple matrix (carbon accrual vs. time) estimates for potential future carbon stocks were derived for the collective study area, as well as for individual landowners. Carbon accrual rates were modified to account for levels of degradation as well as % spekboom cover.



5. Results:

In general, the private farmland in the study area is dominated by vegetation that is not spekboom rich. Merely 26.5% of the total area is deemed to have contained spekboom at densities ranging from 10-50% of the canopy cover. The vegetation that constitutes the focus of this report has been loosely labelled spekboomveld and no effort has been made to make specific vegetation classes. A key finding during the field work was the highly heterogeneous nature of the degradation within the vegetation communities, typified by intact bushclumps in a matrix of degraded landscapes. This prevented highly accurate mapping due to the budget and time limitations. A good example of this is in the degradation class “pristine-moderate” degradation.

5.1 Vegetation degradation mapping

Around 55% of the available degraded area affords the highest net gain for carbon capture through restoration (“severe” class). “Pristine-Moderate” accounts for the second largest fraction, followed by “moderate-severe”.

In comparison to [Lloyd et al. \(2002\)](#) and [Euston-Brown \(2006\)](#), the “severe” degradation is currently far more widespread, especially in the western section of the study area (approaching 7 000 ha's). Total degradation is considerably less than what Euston-Brown recorded (Table 5), and this does include areas that have mosaics of “pristine-moderate” degradation.

Table 5: Summary degradation statistics for subtropical thicket vegetation (Vlok 2010).

Degradation Class	Hectares
Pristine-Moderate	3 779.4
Moderate	340.1
Moderate-Severe	1 469.3
Severe	6 747.1
TOTAL	12 335.9

Spatially the degradation is concentrated on the northern slopes and the mid section of the Baviaanskloof Valley (Figure 6). It is important to study Figure 7 in conjunction with Figure 6, when ascertaining the focus areas for carbon credit earning potential.

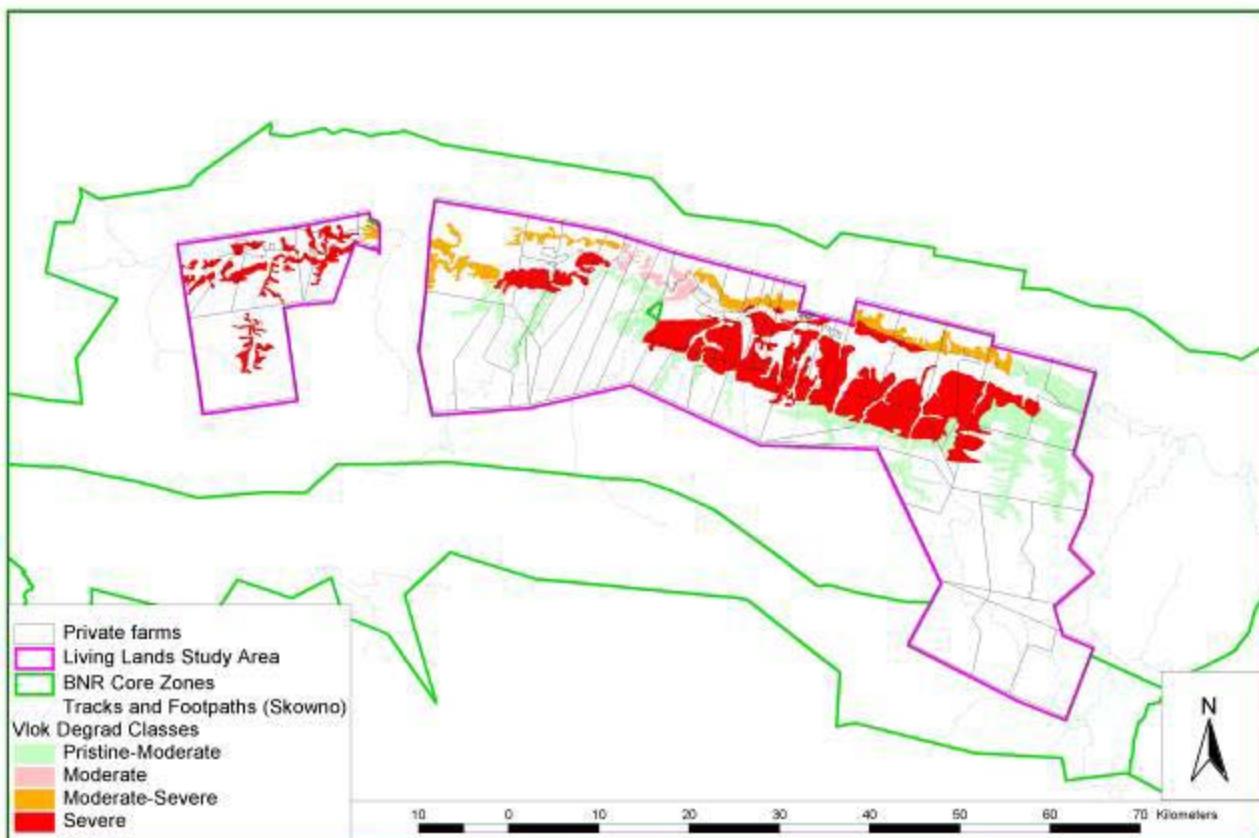


Figure 6: Degradation for subtropical thicket vegetation (Vlok 2010).

Table 6 : Summary of degradation hectares per property from Vlok (2010).

Landowner Details	Farm	TOTAL Hectares	Pristine-Moderate	% of Total Spekboomveld	Moderate	% of Total Spekboomveld	Moderate-Severe	% of Total Spekboomveld	Severe	% of Total Spekboomveld	TOTAL Spekboom Veld	
BIDDULPH	BEAKOS NEK	985.3	120.2	66.5%	60.6	33.5%	0.0	0.0%	0.0	0.0%	180.8	
CONGREGATIONAL CHURCH - WILLOWMORE	RIET RIVIER	29.5	0.0	0.0%	0.0	0.0%	0.0	0.0%	16.5	100.0%	16.5	
CREATIVE FUTURES COMMUNITY TRUST	DE KLIP FONTEIN	614.9	34.7	17.1%	0.0	0.0%	0.9	0.4%	167.5	82.5%	203.1	
DREAM WORLD INV 127 PTY LTD	ROCKSAND	347.6	0.0	0.0%	0.0	0.0%	0.0	0.0%	82.2	100.0%	82.2	
DU PREEZ	VERLAATEN RIVIER	325.7	0.0	0.0%	0.0	0.0%	0.0	0.0%	86.8	100.0%	86.8	
DU PREEZ FAMILY TRUST	RIET RIVIER	572.6	0.0	0.0%	0.0	0.0%	0.0	0.0%	112.0	100.0%	112.0	
EDUCATIONAL TRUSTEES	DE KLIP FONTEIN	0.4	0.0	0.0%	0.4	100.0%	0.0	0.0%	0.0	0.0%	0.4	
ERJEE TRUST	ZAND VLAKTE	518.8	251.5	100.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	251.5	
HONEY	UITSLAG	2985.0	89.8	23.2%	0.0	0.0%	126.1	32.5%	171.8	44.3%	387.7	
INITIATIVE S A INV 71 PTY LTD	DE KLIP FONTEIN	2171.7	154.5	18.3%	0.0	0.0%	0.0	0.0%	689.0	81.7%	843.5	
LAMPRECHT - TRUSTEES	BEAKOS NEK	9886.8	871.5	21.1%	69.1	1.7%	419.8	10.1%	2776.9	67.1%	4137.3	
LEZMIN 2087 C C	MATJESFONTEIN	2603.6	0.0	0.0%	0.0	0.0%	0.0	0.0%	186.3	100.0%	186.3	
NED GER KERK - WILLOWMORE	KLIP FONTEIN	3.1	0.0	0.0%	0.0	0.0%	2.2	100.0%	0.0	0.0%	2.2	
NORTJE	KOUD NEKS RANTE	4096.1	104.1	100.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	104.1	
UNKNOWN	ZAND VLAKTE	1.0	0.3	100.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.3	
REYNEKE	DE KLIP FONTEIN	500.3	0.0	0.0%	48.4	37.3%	81.2	62.7%	0.0	0.0%	129.6	
ROOIKLOOF C C	ZAND VLAKTE	578.2	296.2	94.4%	0.0	0.0%	0.0	0.0%	17.6	5.6%	313.8	
SEWEFONTEIN GEMEENSKAPSBOERDERY TRUST	DE KLIP FONTEIN	1410.2	6.5	1.2%	117.5	22.2%	82.1	15.5%	323.2	61.1%	529.3	
SMITH D	RIET RIVIER	547.6	0.5	0.1%	0.0	0.0%	121.9	22.9%	410.3	77.0%	532.7	
SMITH N	KLEIN POORT	3927.7	0.0	0.0%	0.0	0.0%	0.0	0.0%	87.1	100.0%	87.1	
TERBLANCHE	RIET RIVIER	1473.9	0.0	0.0%	0.0	0.0%	0.0	0.0%	270.8	100.0%	270.8	
UNITED CONGREGATIONAL CHURCH OF SOUTH A	DE KLIP FONTEIN	179.0	0.0	0.0%	0.0	0.0%	33.7	73.4%	12.2	26.6%	45.9	
VAN DER WAT	BEAKOS NEK	1023.0	250.3	77.8%	44.1	13.7%	0.0	0.0%	27.3	8.5%	321.7	
VAN RENSBURG MG	KLIP FONTEIN	800.6	0.2	0.0%	0.0	0.0%	1.2	0.3%	450.7	99.7%	452.1	
VAN RENSBURG RJ	VERLOREN RIVIER	5155.0	337.3	31.8%	0.0	0.0%	436.8	41.2%	286.7	27.0%	1060.8	
VORSTER	ROCKSAND	688.8	0.0	0.0%	0.0	0.0%	59.8	31.2%	132.0	68.8%	191.8	
ZANDVLAKTE BOERDERY TRUST	SAND RIVER	5117.0	1261.8	69.9%	0.0	0.0%	103.6	5.7%	440.2	24.4%	1805.6	
TOTALS		46 543.4	3 779.4		340.1			1 469.3		6 747.1		12 335.9

5.2 Extent of Spekboom distribution

Figure 7 below is a critical piece of the restoration puzzle and should be used in conjunction with the degradation map to compile the restoration and business plans. The distribution of spekboom is not too dissimilar to that mapped by the STEP programme ([Vlok & Euston-Brown 2002](#), [Vlok et al. 2003](#)), but the estimation of the % cover for spekboom is a major improvement ([Vlok 2010](#)).

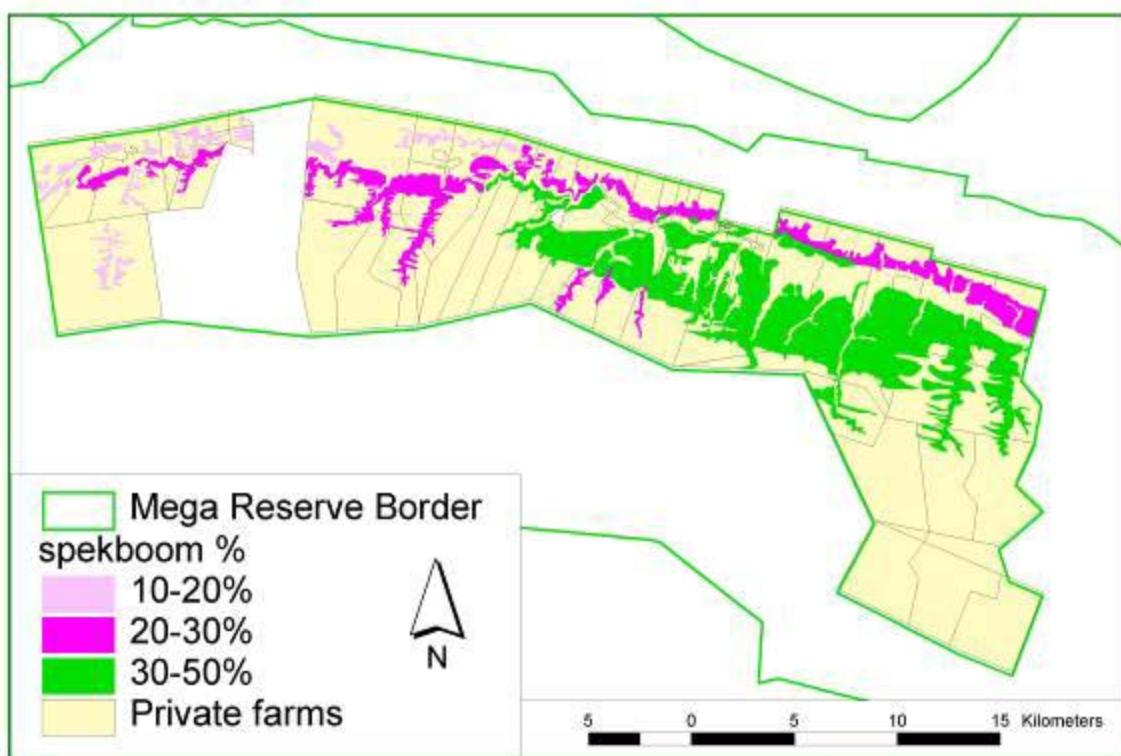


Figure 7. The estimated % cover of spekboom for intact vegetation in the study area according to [Vlok \(2010\)](#).

The spatial correlation between spekboom % cover and degradation is relatively high (i.e. the higher the spekboom %, generally the higher the degree of degradation). Spekboom is well known for favouring hot dry northern slopes. The higher elevation in the western areas will bring extreme temperatures and frost, making the habitat less suitable for spekboom.



6. Discussion

6.1 Restoration and carbon credit potential – cooperatively

Mills & Cowling (2006), provide a wide range with regards to the carbon accrual rates that have been documented for planted truncheons of *P. afra*. The most frequently cited figure of $4.2 \text{ t C ha}^{-1} \text{ yr}^{-1}$ comes from Krompoort near Kirkwood but was only found for the ecotype/variant called “bergspekboom”. The C accrual second figure ($2.4 \text{ t C ha}^{-1} \text{ yr}^{-1}$) was recorded for the locally abundant form of spekboom, at the same location. The last figure ($0.4 \text{ t C ha}^{-1} \text{ yr}^{-1}$) was recorded in the Fish River Nature Reserve. The question that forms the crux of the restoration potential using *P. afra*, with a view to using carbon credit finance is: which is the most realistic estimate to adopt. A further confounding variable is the planting density of the cut *P. afra* truncheons. The accrual rates of 4.2 and 2.4 were attained with planting intervals of 1m between plants and 2m between rows (Mill & Cowling 2006), which approximates 5 000 stems per hectare (assuming optimal survivorship or regular replanting for mortalities). Depending on a number of variables (catena position, vegetation type and level of degradation), the planting density may need to be modified accordingly. The planting interval and therefore planting density provide a tricky trade-off between returning the correct carbon stocks (directly attributable to spekboom biomass) and over-densification in the pursuit of maximising carbon credits.

A standard protocol of planting 2000-3000 stems per hectare as advocated by the WfWoodlands Programme is too simplistic. Hypothetically a vegetation community that historically was endowed with 40% spekboom cover could become super saturated when the 2 000 surviving plants become mature trees (typically with a radius of 1.5-2m). A hypothetical planting model is depicted below: ~1 000-1 250 stems in a hectare (1 stem per 8m²), and mature plant canopy radius of 1.5m.

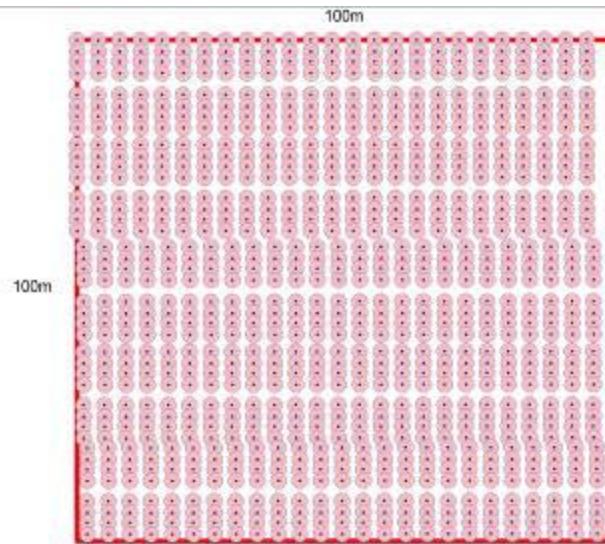


Figure 8. The effect of planting density on final *P. afra* canopy after 20-30 years.

It is our contention that more thought needs to be given to the restoration protocols with regards to the spekboom plantings per hectare. Super-saturation with cuttings with a view to replenishing the soil C content may appear initially a prudent approach, but the full implications of this have not been tested and the evidence that biodiversity will return in time to occupy the same patterns and assembly rules prior to degradation is lacking. The Western Kloof has the potential to become fully incorporated into the Baviaanskloof Nature Reserve, and hence become part of the prestigious world heritage site fraternity. A major concern for the future would be that should planting be conducted at super-density, and survivorship is good, the funding to thin out the excess plants may not be available. Furthermore, engaging with the carbon credit markets implies a measure of permanence – it is vital to get the numbers correct at the onset.



Carbon farming (and therefore restoration of degraded subtropical thickets) in the Western Kloof has effectively two strategic routes to follow. It is our belief that to effect holistic and large-scale land-use change it is imperative that the various agencies involved pool resources to provide the greatest net suite of incentives for all landowners. Due to the fact that subtropical thicket vegetation, spekboom % cover and degradation of subtropical thickets are not evenly distributed through the study area the first strategic route to explore would be one of a cooperative or a trust. A central premise would be to pool the income streams and financial incentives and provide prorata benefits based on property size or the level of stewardship agreement.

We would strongly advocate this route for the simple reason is that the carbon farming potential is largely resident in the larger 4-5 properties adjacent to Koleskeplaas. Without proper incentivisation, these landowners could become locked into a contract with a carbon developer, thereby negating any spread of benefits to the landowners further up the valley.

This report/assessment will focus primarily on the potential for carbon farming in a cooperative model. The data will be presented for individual landowners as appendices.

Three possible income streams/financial models may be possible for the landowners in the study area. 1) Land rental to the project developer, 2) The landowner/s become the project developers and finance all the costs, take all the risks and thereby could be in a position to maximise the profits, 3) the landowners/project developers enter into an equity agreement and share capitalisation costs, project risk and ultimately profits/losses.

A particular feature of the Baviaanskloof valley is the vegetation gradient that runs largely N-S with Fynbos on the higher slopes, subtropical thicket/woodland in the middle (depending on aspect) and doringveld in the valleys. The implications for carbon farming are that very few properties will have degraded subtropical thicket as the dominant land cover. A carbon project developer has no financial basis for renting Fynbos or doringveld. Table 6 below summarises the potential incomes for the various



landowners based on the hectares of restorable land (NB – these figures have not been corrected for levels of degradation or % spekboom cover).

The second option (shared equity) is potentially a win-win for all stakeholders as it secures continued interest and commitment to the process. Financially and legally it is complicated and beyond the scope of this report. The results and predictions from the third option (landowner is a project developer) will provide sufficient insights with regards to this initial feasibility assessment



Table 7. Hypothetical rental incomes for degraded subtropical thicket areas only.

OWNER			
	@ R100 ha ⁻¹ yr ⁻¹	@ R75 ha ⁻¹ yr ⁻¹	@ R50 ha ⁻¹ yr ⁻¹
BIDDULPH	R 19,730	R 13,560	R 9,040
CONGREGATIONAL CHURCH - WILLOWMORE	R 1,650	R 1,238	R 825
CREATIVE FUTURES COMMUNITY TRUST	R 20,310	R 15,233	R 10,155
DREAM WORLD INV 127 PTY LTD	R 8,220	R 6,165	R 4,110
DU PREEZ	R 8,680	R 6,510	R 4,340
DU PREEZ FAMILY TRUST	R 11,200	R 8,400	R 5,600
EDUCATIONAL TRUSTEES	R 40	R 30	R 20
ERJEE TRUST	R 25,150	R 18,863	R 12,575
HONEY	R 38,770	R 29,078	R 19,385
INITIATIVE S A INV 71 PTY LTD	R 84,350	R 63,263	R 42,175
LAMPRECHT - TRUSTEES	R 413,730	R 310,298	R 206,865
LEZMIN 2087 C C	R 18,630	R 13,973	R 9,315
NEDERDUILTS GEREFORMEerde Kerk	R 220	R 165	R 110
NORTJE	R 10,410	R 7,808	R 5,205
REYNEKE	R 12,960	R 9,720	R 6,480
ROOIKLOOF C C	R 31,380	R 23,535	R 15,690
SEWFONTEIN GEMEENSKAPSBOERDERY TRUST	R 52,930	R 39,698	R 26,465
SMITH D	R 53,270	R 39,953	R 26,635
SMITH N	R 8,710	R 6,533	R 4,355
TERBLANCHE	R 27,080	R 20,310	R 13,540
UNITED CONGREGATIONAL CHURCH OF SA	R 4,590	R 3,443	R 2,295
VAN DER WAT	R 32,170	R 24,128	R 16,085
VAN RENSBURG MG	R 45,210	R 33,908	R 22,605
VAN RENSBURG RJ	R 106,080	R 79,560	R 53,040
VORSTER	R 19,180	R 14,385	R 9,590
ZANDVLAKTE BOERDERY TRUST	R 180,560	R 135,420	R 90,280
TOTALS	R 1,235,210	R 925,170	R 616,780

Approximately 12 336 hectares of “spekboomveld” is potentially available for restoration and carbon farming. A supreme optimist would plant all hectares abundantly and employ the optimum carbon accrual rate over the 30 year lifespan of a project and expect to receive 5.699 million carbon credits. Table 8 below illustrates a sensitivity analysis with carbon accrual rates of 1,2 and 4 t C ha⁻¹ yr⁻¹ (averaged over 10, 20 and 30 years) and time over 10, 20 and 30 years.



Table 8: Carbon credit estimates based on carbon accrual sensitivity analysis (with no conversion factor for % spekboom cover or degradation level).

Carbon accrual in t C ha ⁻¹ yr ⁻¹	Time in years		
	10	20	30
1	456 428	912 856	1 369 284
2	912 856	1 825 713	2 738 569
4	1 825 713	3 651 426	5 477 139

Unfortunately these numbers are inflated and correction factors need to be applied. For example where a given piece of land is moderately degraded there must be residual spekboom in the canopy cover. These carbon stocks need to be discounted, and therefore the mean carbon accrual per hectare must be reduced. Similarly where a vegetation historically only exhibited 10-20% spekboom canopy cover it could never achieve 4.2 C ha⁻¹ yr⁻¹ without over-densification. In other words a carbon accrual gradient exists with the best opportunity being in severely degraded areas that had maximum % spekboom cover and the least opportunity being in the areas where pristine-moderate degradation occurred and spekboom % cover was historically 10-20%. The table below reflects our attempt at more realistic estimates for the carbon credit possibilities for the study area as a whole. It is extremely important to note that the C accrual rates are taken as averages and it is more likely that a non-linear growth curve should be applied to spekboom growth.



Table 9: Carbon credit estimates based on carbon accrual sensitivity analysis (with conversion factor for % spekboom cover and a conversion factor for degradation level).

Carbon accrual in t C ha ⁻¹ yr ⁻¹	Time in years		
	10	20	30
1	241 820	483 639	725 458
2	483 639	967 279	1 450 916
4	967 279	1 934 543	2 901 814

Despite all mapping data being corrected to account for levels of degradation and spekboom % cover, the estimates in Table 9 above may still be optimistic. One possible reason could be that the residual spekboom % in the “pristine-moderate” category may be sufficiently high or of a heterogeneous nature, rendering these areas too costly for baseline assessments. A prudent approach may be to exclude these areas from the financial feasibility assessment. These data require more detailed interrogation.

NB – it should also be stressed that for this preliminary assessment mean carbon accrual rates have been employed. In other words, the literature ([Mills & Cowling 2006](#)) has provided ballpark figures for carbon accrual that has been AVERAGED over a period of 30 years. It is almost certain that the growth curve for a planted cutting is not a linear function. This implies that in all likelihood the predictions presented in this report are over-estimates in the 10 year period. This would be another sound reason to focus on the feasibility in the 20-30 year time horizon and not the 10 year horizon.



Table 10: Carbon credit income estimates based on carbon accrual sensitivity analysis (with conversion factor for % spekboom cover and a conversion factor for degradation level) and related to the \$ per t CO_{2e}. *

C price	Low Accrual Rate		Discounted		Low Accrual Rate		Discounted		Low Accrual Rate		Discounted	
	10 years	@ 5%	20 years	@ 5%	30 Years	@ 5%	10 years	@ 5%	30 Years	@ 5%	10 years	@ 5%
\$ 5	R 8,463,700	R 5,195,978	R 16,927,365	R 6,379,746	R 25,391,030	R 5,874,912						
\$ 10	R 16,927,400	R 10,391,955	R 33,854,730	R 12,759,492	R 50,782,060	R 11,749,823						
\$ 15	R 25,391,100	R 15,587,933	R 50,782,095	R 19,139,238	R 76,173,090	R 17,624,735						
\$ 20	R 33,854,800	R 20,783,910	R 67,709,460	R 25,518,983	R 101,564,120	R 23,499,647						
\$ 25	R 42,318,500	R 25,979,888	R 84,636,825	R 31,898,729	R 126,955,150	R 29,374,559						
\$ 30	R 50,782,200	R 31,175,866	R 101,564,190	R 38,278,475	R 152,346,180	R 35,249,470						
\$ 40	R 67,709,600	R 41,567,821	R 135,418,920	R 51,037,967	R 203,128,240	R 46,999,294						
\$ 50	R 84,637,000	R 51,959,776	R 169,273,650	R 63,797,458	R 253,910,300	R 58,749,117						
\$ 75	R 126,955,500	R 77,939,664	R 253,910,475	R 95,696,188	R 380,865,450	R 88,123,676						
\$ 100	R 169,274,000	R 103,919,552	R 338,547,300	R 127,594,917	R 507,820,600	R 117,498,235						

* All \$: Rand conversions in the document use 1: 7

Table 11: Carbon credit income revenues (expressed as R ha⁻¹ yr⁻¹) based on carbon accrual sensitivity analysis (with conversion factor for % spekboom cover and a conversion factor for degradation level, and for all levels of degradation.)

C price	Low accrual rate and 10 years		Low accrual rate and 20 years		Low accrual rate and 30 years	
	Total Area	Spekboomveld	Total Area	Spekboomveld	Total Area	Spekboomveld
\$ 5	R 11	R 42	R 7	R 26	R 4	R 16
\$ 10	R 22	R 84	R 14	R 52	R 8	R 32
\$ 15	R 34	R 126	R 21	R 78	R 13	R 48
\$ 20	R 45	R 168	R 27	R 103	R 17	R 63
\$ 25	R 56	R 211	R 34	R 129	R 21	R 79
\$ 30	R 67	R 253	R 41	R 155	R 25	R 95
\$ 40	R 89	R 337	R 55	R 207	R 34	R 127
\$ 50	R 112	R 421	R 69	R 259	R 42	R 159
\$ 75	R 168	R 632	R 103	R 388	R 63	R 238
\$ 100	R 223	R 842	R 137	R 517	R 84	R 317

A key factor in the feasibility assessment for the carbon farming as a potential source of revenue stream for a land use change is going to be the restoration cost to the



investors/developers. Restoration costs are highly variable depending on a host of factors (terrain, access, plant survivorship etc.) Tables 12 and 13 below give a crude indication of the impact of restoration costs on the profitability margins for the study area.

Table 12. Estimated net income for all restoration areas (discounted @ 5%) as a function of time, carbon accrual rates, carbon credit sales price and restoration costs of R1 000 per hectare.

		Low carbon accrual	Low carbon accrual	Low carbon accrual
C price		10 years	20 years	30 years
\$ 5	R	-3,304,022	R -2,120,254	R -2,625,088
\$ 10	R	1,891,955	R 4,259,492	R 3,249,823
\$ 15	R	7,087,933	R 10,639,238	R 9,124,735
\$ 20	R	12,283,910	R 17,018,983	R 14,999,647
\$ 25	R	17,479,888	R 23,398,729	R 20,874,559
\$ 30	R	22,675,866	R 29,778,475	R 26,749,470
\$ 40	R	33,067,821	R 42,537,967	R 38,499,294
\$ 50	R	43,459,776	R 55,297,458	R 50,249,117
\$ 75	R	69,439,664	R 87,196,188	R 79,623,676
\$ 100	R	95,419,552	R 119,094,917	R 108,998,235

With an estimated break-even point of \$10 per carbon credit and restoration costs of R1 000 per hectare, the major unknown factor is the investor's appetite for risk and what return of investment will be attractive enough to warrant a 30 year project. When the estimations are run again with R7 500 per hectare restoration cost (very possible) it would appear that the project would not be viable until carbon credit prices reach the (currently) highly unrealistic \$75+ range. It should be stressed that all the above assumptions need to be kept in mind (correction factors, conservative carbon accrual rates etc.). Furthermore the table below does not account for potential co-funding from the Working-for-Woodlands Programme (possibly 50%), in-kind funding from the farmers and landowners, as well as equity-cofinancing from the landowners.



Table 13. Estimated net income for all restoration areas (discounted @ 5%) as a function of time, carbon accrual rates, carbon credit sales price and restoration costs of R7 500 per hectare.

C price	Low carbon accrual		Low carbon accrual
	10 years	20 years	30 years
\$ 5	R -58,554,022	R -57,370,254	R -57,875,088
\$ 10	R -53,358,045	R -50,990,508	R -52,000,177
\$ 15	R -48,162,067	R -44,610,762	R -46,125,265
\$ 20	R -42,966,090	R -38,231,017	R -40,250,353
\$ 25	R -37,770,112	R -31,851,271	R -34,375,441
\$ 30	R -32,574,134	R -25,471,525	R -28,500,530
\$ 40	R -22,182,179	R -12,712,033	R -16,750,706
\$ 50	R -11,790,224	R 47,458	R -5,000,883
\$ 75	R 14,189,664	R 31,946,188	R 24,373,676
\$ 100	R 40,169,552	R 63,844,917	R 53,748,235

6.2 Intact carbon stocks for the purpose of REDD (Reduced Emissions from Deforestation and Degradation).

From Table 6 above it would appear that there is potentially ~3 800 ha's of pristine or near pristine spekboom rich vegetation. There is currently very little market opportunity for this intact carbon stock, but the potential exists to create one – especially on the voluntary market and give the special nature of the initiative to change land use to a more sustainable one ([Powell 2010 – see appendix 32](#)). Hypothetically it is conceivable to find a carbon offsetter that would be prepared to pay \$5 per tonne of carbon. This could net an additional income into the cooperative trust of ~ R58m over a thirty year period (assuming intact C = ~120 t C per ha, [Powell 2011](#)). This could transpire to an additional income per property owner of close to ~R50 ha⁻¹ yr⁻¹ (total farm area) and ~R157 ha⁻¹ yr⁻¹ (spekboom rich area only). It should be stressed that the attainment of carbon credit certification for the REDD areas could yield 4-5 fold the \$ per t C, especially with VCS or CCBA accreditation and the marketability of the Baviaanskloof MegaReserve/World Heritage Site. The effort and resources to complete the baselines and obtain validation for a REDD methodology will be considerable. The Rhodes Restoration Research Group is actively pursuing this as a priority.



6.3 Carbon credit potential – farm by farm

Summary data for each property is presented in the section below. Although, the analyses cover the range (time and accrual rate) it is far more probable to assume carbon accrual rates will be in the order of $1 \text{ t C ha}^{-1} \text{ yr}^{-1}$ (condensed hectares) and project viability will only be realised in the 20-30 year time horizon. It is very likely that C will continue to be captured and stored after 50 years. For detailed projections, all listed properties below, only the lowest C accrual rate has been employed for each time period (10, 20 and 30 years). **All potential carbon credit incomes are discounted at 5% to reflect current day value.** It should be emphasized that these values exclude all development, project costs and transaction costs. It should be noted that unlike the Collective/Cooperative Model assessment above, the individual farm assessments have been done with all the vegetation degradation classes. It may still be worth completing the assessments as per table above.

Some discussion has been provided for the first property (Biddulph) which allows scope for similar interrogation for all subsequent properties. Time and budget constraints prevented a detailed discussion – property by property. It is hoped that the data provided will provide sufficient material for this initial feasibility study. As a very crude guideline it may be prudent to use 1000 hectares of degraded habitat (condensed hectares) as a cut-off in terms of stand-alone viability for the purposes of attaining carbon credits through restoration or *vice versa*.

One title deed (farm Zandvlakte, 1.0 ha) was listed as “unknown” in the deeds register and has since been disregarded from further analyses.

6.3.1 Biddulph Property

Using the carbon accrual sensitivity matrix (Table 12), potential carbon credit earnings could range from 2 300 (low accrual rate and low time) to 28 000 (high accrual rate and high time). This property has a high % of the vegetation in a “pristine-moderate” condition (Appendix 4) and therefore predictions should be seen as preliminary.

Table 14. CO₂e accrual sensitivity matrix for the Biddulph property.

Carbon in t C ha ⁻¹ yr ⁻¹	Time in years		
	10	20	30
1	2 340	4 679	7 019
2	4 679	9 358	14 038
4	9 358	18 717	28 074

The exclusion of the “pristine-moderate” degradation category brings the range of carbon credits to 560 (1 and 10 years) to 6 700 (4 and 30 years).

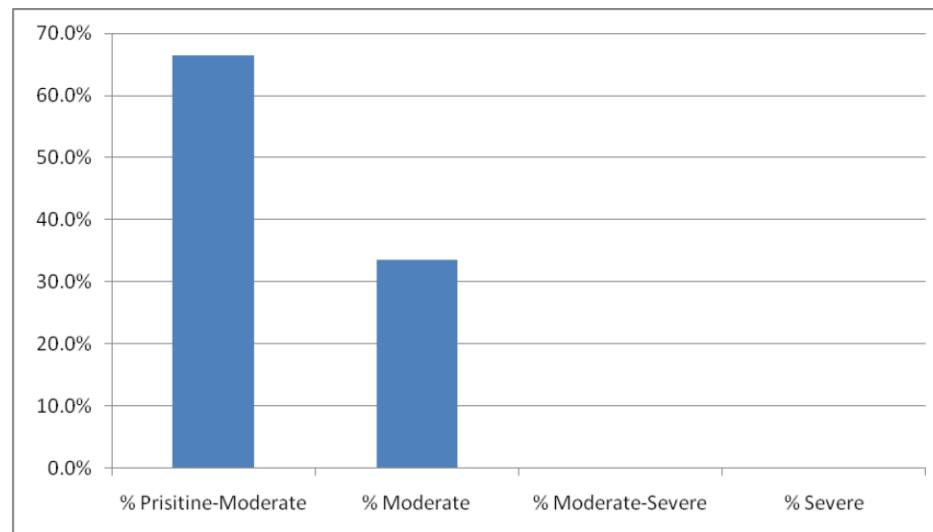


Figure 9. Relative percentages for spekboom-rich vegetation degradation classes for the Biddulph property.



With the **low accrual rate** and all vegetation data included, preliminary estimates are tabled below.

Table 15. Predicted revenue for carbon credits income for the Biddulph property (discounted @ 5%).

	Low C Accrual	Discounted	Low C Accrual	Discounted	Low C Accrual	Discounted
C price	10 years	@ 5%	20 years	@ 5%	30 years	@ 5%
\$ 5	R 81,900	R 50,279	R 163,765	R 61,721	R 245,665	R 56,841
\$ 10	R 163,800	R 100,559	R 327,530	R 123,443	R 491,330	R 113,683
\$ 15	R 245,700	R 150,838	R 491,295	R 185,164	R 736,995	R 170,524
\$ 20	R 327,600	R 201,118	R 655,060	R 246,885	R 982,660	R 227,365
\$ 25	R 409,500	R 251,397	R 818,825	R 308,607	R 1,228,325	R 284,207
\$ 30	R 491,400	R 301,677	R 982,590	R 370,328	R 1,473,990	R 341,048
\$ 40	R 655,200	R 402,236	R 1,310,120	R 493,770	R 1,965,320	R 454,731
\$ 50	R 819,000	R 502,795	R 1,637,650	R 617,213	R 2,456,650	R 568,413
\$ 75	R 1,228,500	R 754,192	R 2,456,475	R 925,820	R 3,684,975	R 852,620
\$ 100	R 1,638,000	R 1,005,590	R 3,275,300	R 1,234,426	R 4,913,300	R 1,136,827

Table 16: Carbon credit income revenues for the Biddulph Property (expressed as R ha⁻¹ yr⁻¹ per collective title deeds and restoration areas) based on carbon accrual sensitivity analysis (with conversion factor for % spekboom cover and a conversion factor for degradation level, and *for all levels of degradation*).

	Low C Accrual 10 years		Low C Accrual 20 years		Low C Accrual 30 years	
	Total Area	Spekboomveld	Total Area	Spekboomveld	Total Area	Spekboomveld
C price	985 ha's	181 ha's	985 ha's	181 ha's	985 ha's	181 ha's
\$ 5	R 5	R 28	R 3	R 17	R 2	R 10
\$ 10	R 10	R 56	R 6	R 34	R 4	R 21
\$ 15	R 15	R 83	R 9	R 51	R 6	R 31
\$ 20	R 20	R 111	R 13	R 68	R 8	R 42
\$ 25	R 26	R 139	R 16	R 85	R 10	R 52
\$ 30	R 31	R 167	R 19	R 102	R 12	R 63
\$ 40	R 41	R 222	R 25	R 136	R 15	R 84
\$ 50	R 51	R 278	R 31	R 171	R 19	R 105
\$ 75	R 77	R 417	R 47	R 256	R 29	R 157
\$ 100	R 102	R 556	R 63	R 341	R 38	R 209



6.3.2 Congregation Church

Table 17. CO₂e accrual sensitivity matrix for the Congregational Church property.

Carbon in t C ha ⁻¹ yr ⁻¹	Time in years		
	10	20	30
1	122	244	366
2	244	488	733
4	488	977	1 465

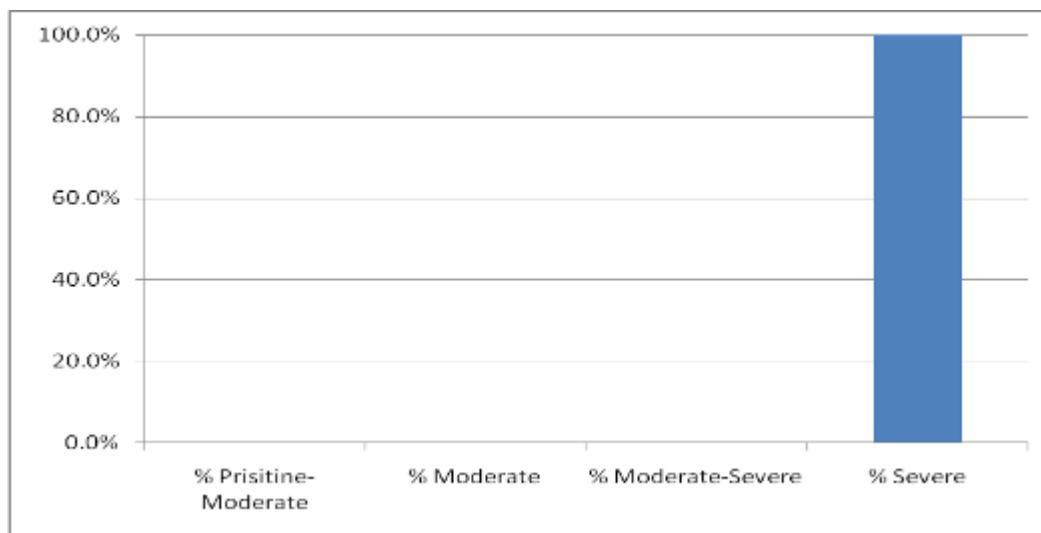


Figure 10. Relative percentages for spekboom-rich vegetation degradation classes for the Congregation Church property.

Table 18. Predicted revenue for carbon credits for the Congregational Church property.

	Low C Accrual	Discounted	Low C Accrual	Discounted	Low C Accrual	Discounted
C price	10 years	@ 5%	20 years	@ 5%	30 years	@ 5%
\$ 5	R 4,270	R 2,621	R 8,540	R 3,219	R 12,810	R 2,964
\$ 10	R 8,540	R 5,243	R 17,080	R 6,437	R 25,620	R 5,928
\$ 15	R 12,810	R 7,864	R 25,620	R 9,656	R 38,430	R 8,892
\$ 20	R 17,080	R 10,486	R 34,160	R 12,875	R 51,240	R 11,856
\$ 25	R 21,350	R 13,107	R 42,700	R 16,093	R 64,050	R 14,820
\$ 30	R 25,620	R 15,728	R 51,240	R 19,312	R 76,860	R 17,784
\$ 40	R 34,160	R 20,971	R 68,320	R 25,749	R 102,480	R 23,712
\$ 50	R 42,700	R 26,214	R 85,400	R 32,186	R 128,100	R 29,639
\$ 75	R 64,050	R 39,321	R 128,100	R 48,280	R 192,150	R 44,459
\$ 100	R 85,400	R 52,428	R 170,800	R 64,373	R 256,200	R 59,279



Table 19: Carbon credit income revenues for the Congregational Church property (expressed as R ha⁻¹ yr⁻¹ per collective title deeds and per restoration area) based on carbon accrual sensitivity analysis (with conversion factor for % spekboom cover and a conversion factor for degradation level, and for all levels of degradation.)

	Low C Accrual 10 years		Low C Accrual 20 years		Low C Accrual 30 years	
	Total Area	Spekboomveld	Total Area	Spekboomveld	Total Area	Spekboomveld
C price	29.5 ha's	16.5 ha's	29.5 ha's	16.5 ha's	29.5 ha's	16.5 ha's
\$ 5	R 9	R 16	R 5	R 10	R 3	R 6
\$ 10	R 18	R 32	R 11	R 20	R 7	R 12
\$ 15	R 27	R 48	R 16	R 29	R 10	R 18
\$ 20	R 36	R 64	R 22	R 39	R 13	R 24
\$ 25	R 44	R 79	R 27	R 49	R 17	R 30
\$ 30	R 53	R 95	R 33	R 59	R 20	R 36
\$ 40	R 71	R 127	R 44	R 78	R 27	R 48
\$ 50	R 89	R 159	R 55	R 98	R 33	R 60
\$ 75	R 133	R 238	R 82	R 146	R 50	R 90
\$ 100	R 178	R 318	R 109	R 195	R 67	R 120

6.3.3 Creative Futures Community Trust Property

Table 20. CO₂e accrual sensitivity matrix for the Creative Futures Community Trust property.

Carbon in t C ha ⁻¹ yr ⁻¹	Time in years		
	10	20	30
1	5 227	10 453	15 679
2	10 453	20 906	31 359
4	20 906	41 811	62 717

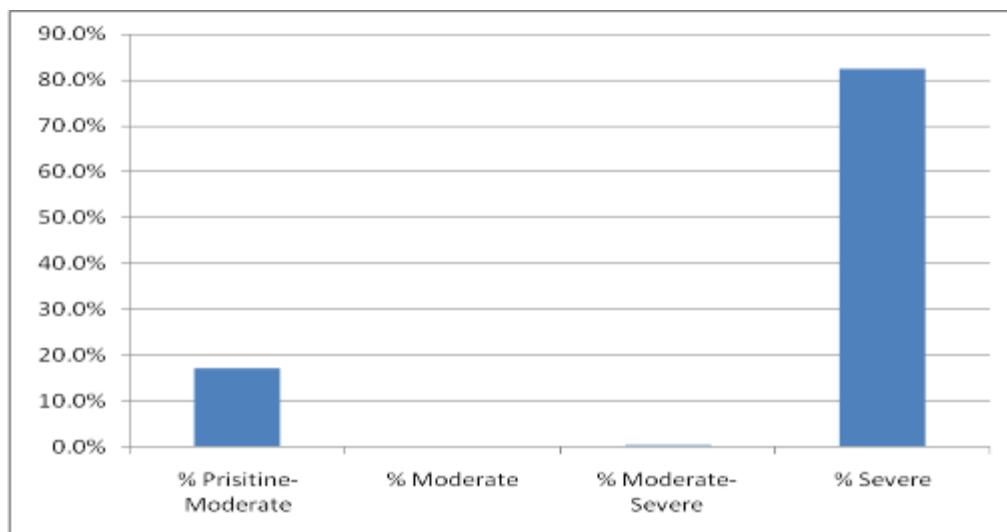


Figure 11. Relative percentages for spekboom-rich vegetation degradation classes for the Creative Futures Community Trust property.

Table 21. Predicted revenue for carbon credits for the Creative Futures Community Trust property.

	Low C Accrual	Discounted	Low C Accrual	Discounted	Low C Accrual	Discounted
C price	10 years	@ 5%	20 years	@ 5%	30 years	@ 5%
\$ 5	R 182,945	R 112,312	R 365,855	R 137,887	R 548,765	R 126,972
\$ 10	R 365,890	R 224,625	R 731,710	R 275,774	R 1,097,530	R 253,944
\$ 15	R 548,835	R 336,937	R 1,097,565	R 413,661	R 1,646,295	R 380,916
\$ 20	R 731,780	R 449,249	R 1,463,420	R 551,548	R 2,195,060	R 507,887
\$ 25	R 914,725	R 561,562	R 1,829,275	R 689,435	R 2,743,825	R 634,859
\$ 30	R 1,097,670	R 673,874	R 2,195,130	R 827,321	R 3,292,590	R 761,831
\$ 40	R 1,463,560	R 898,499	R 2,926,840	R 1,103,095	R 4,390,120	R 1,015,775
\$ 50	R 1,829,450	R 1,123,124	R 3,658,550	R 1,378,869	R 5,487,650	R 1,269,718
\$ 75	R 2,744,175	R 1,684,685	R 5,487,825	R 2,068,304	R 8,231,475	R 1,904,578
\$ 100	R 3,658,900	R 2,246,247	R 7,317,100	R 2,757,738	R 10,975,300	R 2,539,437



Table 22: Carbon credit income revenues for the Creative Futures Community Trust property (expressed as R ha⁻¹ yr⁻¹ per collective title deeds and per restoration area) based on carbon accrual sensitivity analysis (with conversion factor for % spekboom cover and a conversion factor for degradation level, and *for all levels of degradation.*)

	Low C Accrual 10 years		Low C Accrual 20 years		Low C Accrual 30 years	
	Total Area	Spekboomveld	Total Area	Spekboomveld	Total Area	Spekboomveld
C price	615 ha's	203 ha's	615 ha's	203 ha's	615 ha's	203 ha's
\$ 5	R 18	R 55	R 11	R 34	R 7	R 21
\$ 10	R 37	R 111	R 22	R 68	R 14	R 42
\$ 15	R 55	R 166	R 34	R 102	R 21	R 63
\$ 20	R 73	R 221	R 45	R 136	R 28	R 83
\$ 25	R 91	R 277	R 56	R 170	R 34	R 104
\$ 30	R 110	R 332	R 67	R 204	R 41	R 125
\$ 40	R 146	R 443	R 90	R 272	R 55	R 167
\$ 50	R 183	R 553	R 112	R 340	R 69	R 208
\$ 75	R 274	R 830	R 168	R 509	R 103	R 313
\$ 100	R 365	R 1,107	R 224	R 679	R 138	R 417

6.3.4 Dream World Inv 127 Pty (Ltd) Property

Table 23. CO₂e accrual sensitivity matrix for the Dream World Inv 127 Pty (Ltd) property.

Carbon in t C ha ⁻¹ yr ⁻¹	Time in years		
	10	20	30
1	612	1 223	1 834
2	1 223	2 445	3 668
4	2 445	4 889	7 335

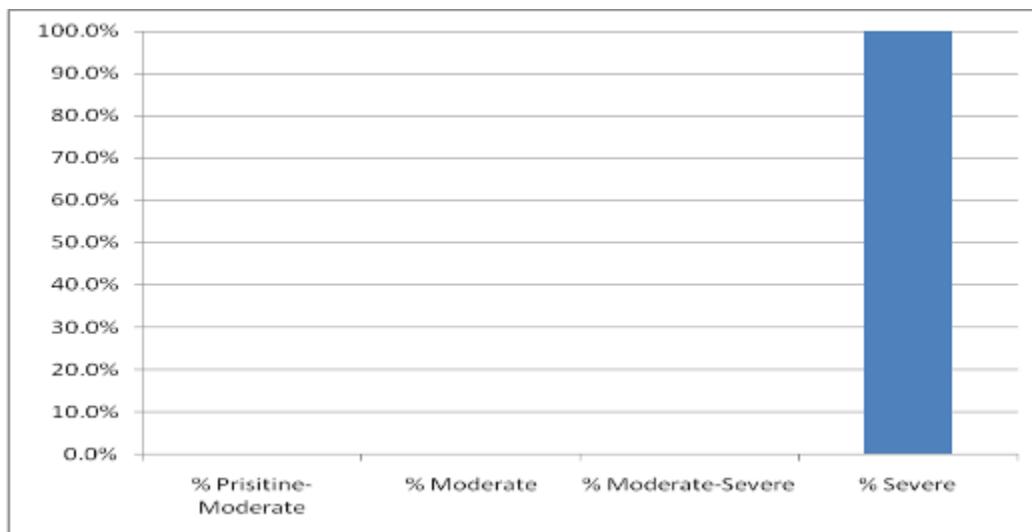


Figure 12. Relative percentages for spekboom-rich vegetation degradation classes for the Dream World Inv 127 Pty (Ltd) property.

Table 24. Predicted revenue for carbon credits for the Dream World Inv 127 Pty (Ltd) Property.

	Low C Accrual	Discounted	Low C Accrual	Discounted	Low C Accrual	Discounted
C price	10 years	@ 5%	20 years	@ 5%	30 years	@ 5%
\$ 5	R 21,420	R 13,150	R 42,805	R 16,133	R 64,190	R 14,852
\$ 10	R 42,840	R 26,300	R 85,610	R 32,266	R 128,380	R 29,704
\$ 15	R 64,260	R 39,450	R 128,415	R 48,398	R 192,570	R 44,556
\$ 20	R 85,680	R 52,600	R 171,220	R 64,531	R 256,760	R 59,408
\$ 25	R 107,100	R 65,750	R 214,025	R 80,664	R 320,950	R 74,261
\$ 30	R 128,520	R 78,900	R 256,830	R 96,797	R 385,140	R 89,113
\$ 40	R 171,360	R 105,200	R 342,440	R 129,062	R 513,520	R 118,817
\$ 50	R 214,200	R 131,500	R 428,050	R 161,328	R 641,900	R 148,521
\$ 75	R 321,300	R 197,250	R 642,075	R 241,991	R 962,850	R 222,782
\$ 100	R 428,400	R 263,000	R 856,100	R 322,655	R 1,283,800	R 297,042



Table 25: Carbon credit income revenues for the Dream World Inv 127 Pty (Ltd) property (expressed as R ha⁻¹ yr⁻¹ per collective title deeds and per restoration area) based on carbon accrual sensitivity analysis (with conversion factor for % spekboom cover and a conversion factor for degradation level, and for all levels of degradation.)

	Low C Accrual 10 years		Low C Accrual 20 years		Low C Accrual 30 years	
	Total Area	Spekboomveld	Total Area	Spekboomveld	Total Area	Spekboomveld
C price	348 ha's	82 ha's	348 ha's	82 ha's	348 ha's	82 ha's
\$ 5	R 4	R 16	R 2	R 10	R 1	R 6
\$ 10	R 8	R 32	R 5	R 20	R 3	R 12
\$ 15	R 11	R 48	R 7	R 30	R 4	R 18
\$ 20	R 15	R 64	R 9	R 39	R 6	R 24
\$ 25	R 19	R 80	R 12	R 49	R 7	R 30
\$ 30	R 23	R 96	R 14	R 59	R 9	R 36
\$ 40	R 30	R 128	R 19	R 79	R 11	R 48
\$ 50	R 38	R 160	R 23	R 98	R 14	R 60
\$ 75	R 57	R 241	R 35	R 148	R 21	R 91
\$ 100	R 76	R 321	R 46	R 197	R 28	R 121

6.3.5 Du Preez Property

Table 26. CO₂e accrual sensitivity matrix for the Du Preez property.

Carbon in t C ha-1 yr-1	Time in years		
	10	20	30
1	849	1 697	2 546
2	1 697	3 396	5 093
4	3 396	6 790	10 186

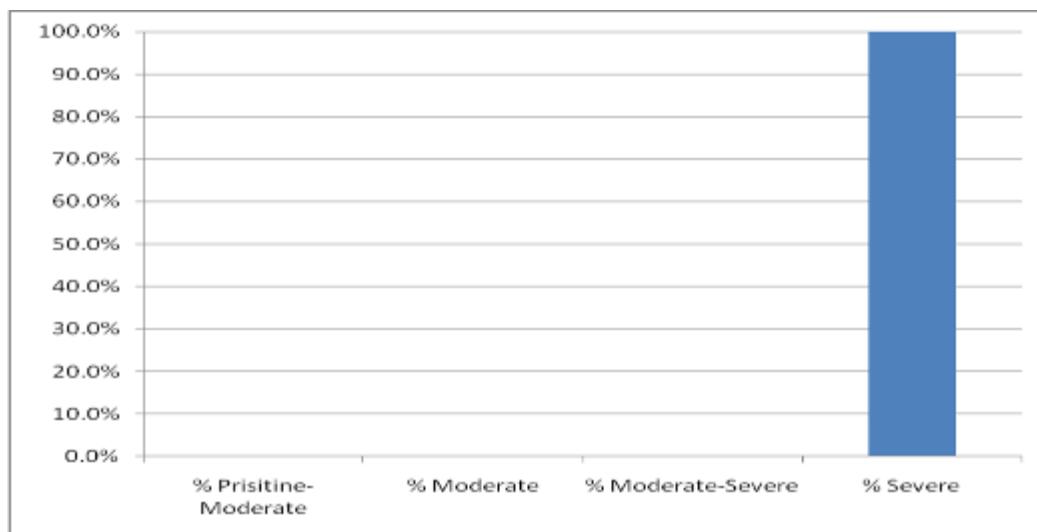


Figure 13. Relative percentages for spekboom-rich vegetation degradation classes for the Du Preez property.

Table 27. Predicted revenue for carbon credits for the Du Preez property.

	Low C Accrual	Discounted	Low C Accrual	Discounted	Low C Accrual	Discounted
C price	10 years	@ 5%	20 years	@ 5%	30 years	@ 5%
\$ 5	R 29,715	R 18,242	R 59,395	R 22,385	R 89,110	R 20,618
\$ 10	R 59,430	R 36,485	R 118,790	R 44,771	R 178,220	R 41,236
\$ 15	R 89,145	R 54,727	R 178,185	R 67,156	R 267,330	R 61,854
\$ 20	R 118,860	R 72,970	R 237,580	R 89,541	R 356,440	R 82,472
\$ 25	R 148,575	R 91,212	R 296,975	R 111,927	R 445,550	R 103,090
\$ 30	R 178,290	R 109,455	R 356,370	R 134,312	R 534,660	R 123,708
\$ 40	R 237,720	R 145,939	R 475,160	R 179,083	R 712,880	R 164,944
\$ 50	R 297,150	R 182,424	R 593,950	R 223,854	R 891,100	R 206,180
\$ 75	R 445,725	R 273,636	R 890,925	R 335,780	R 1,336,650	R 309,271
\$ 100	R 594,300	R 364,849	R 1,187,900	R 447,707	R 1,782,200	R 412,361



Table 28: Carbon credit income revenues for the Du Preez property (expressed as R ha⁻¹ yr⁻¹ per collective title deeds and per restoration area) based on carbon accrual sensitivity analysis (with conversion factor for % spekboom cover and a conversion factor for degradation level, and *for all levels of degradation.*)

	Low C Accrual 10 years		Low C Accrual 20 years		Low C Accrual 30 years	
	Total Area	Spekboomveld	Total Area	Spekboomveld	Total Area	Spekboomveld
C price	326 ha's	87 ha's	326 ha's	87 ha's	326 ha's	87 ha's
\$ 5	R 6	R 21	R 3	R 13	R 2	R 8
\$ 10	R 11	R 42	R 7	R 26	R 4	R 16
\$ 15	R 17	R 63	R 10	R 39	R 6	R 24
\$ 20	R 22	R 84	R 14	R 51	R 8	R 32
\$ 25	R 28	R 105	R 17	R 64	R 11	R 39
\$ 30	R 34	R 126	R 21	R 77	R 13	R 47
\$ 40	R 45	R 168	R 27	R 103	R 17	R 63
\$ 50	R 56	R 210	R 34	R 129	R 21	R 79
\$ 75	R 84	R 315	R 52	R 193	R 32	R 118
\$ 100	R 112	R 419	R 69	R 257	R 42	R 158

6.3.6 Du Preez Family Trust Property

Table 29. CO₂e accrual sensitivity matrix for the Du Preez Family Trust property.

Carbon in t C ha ⁻¹ yr ⁻¹	Time in years		
	10	20	30
1	828	1 658	2 486
2	1658	3 315	4 973
4	3 315	6 631	9 946

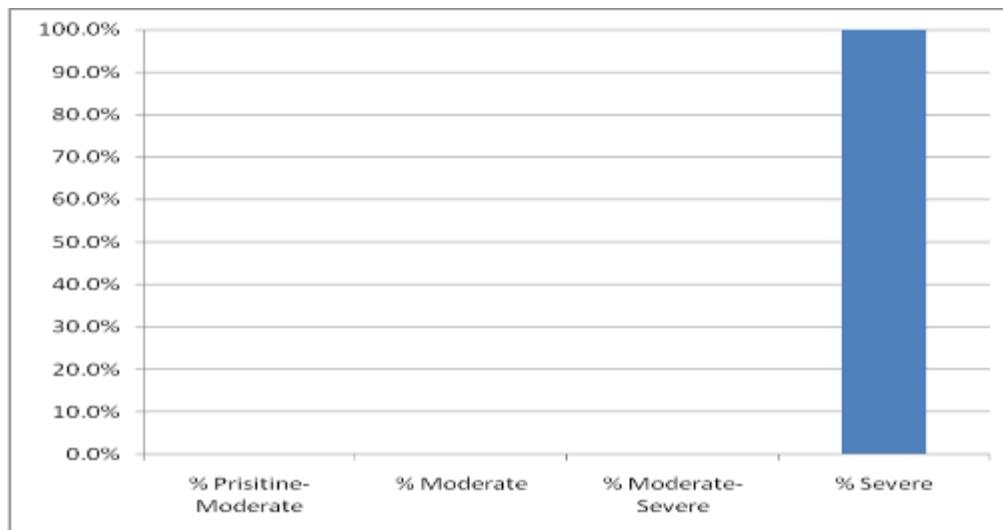


Figure 14. Relative percentages for spekboom-rich vegetation degradation classes for the Du Preez Family Trust property.

Table 30. Predicted revenue for carbon credits for the Du Preez Family Trust property.

	Low C Accrual	Discounted	Low C Accrual	Discounted	Low C Accrual	Discounted
C price	10 years	@ 5%	20 years	@ 5%	30 years	@ 5%
\$ 5	R 28,980	R 17,791	R 58,030	R 21,871	R 87,010	R 20,132
\$ 10	R 57,960	R 35,582	R 116,060	R 43,742	R 174,020	R 40,264
\$ 15	R 86,940	R 53,374	R 174,090	R 65,613	R 261,030	R 60,396
\$ 20	R 115,920	R 71,165	R 232,120	R 87,484	R 348,040	R 80,529
\$ 25	R 144,900	R 88,956	R 290,150	R 109,354	R 435,050	R 100,661
\$ 30	R 173,880	R 106,747	R 348,180	R 131,225	R 522,060	R 120,793
\$ 40	R 231,840	R 142,330	R 464,240	R 174,967	R 696,080	R 161,057
\$ 50	R 289,800	R 177,912	R 580,300	R 218,709	R 870,100	R 201,322
\$ 75	R 434,700	R 266,868	R 870,450	R 328,063	R 1,305,150	R 301,982
\$ 100	R 579,600	R 355,824	R 1,160,600	R 437,418	R 1,740,200	R 402,643



Table 31: Carbon credit income revenues for the Du Preez Family Trust property (expressed as R ha⁻¹ yr⁻¹ per collective title deeds and per restoration area) based on carbon accrual sensitivity analysis (with conversion factor for % spekboom cover and a conversion factor for degradation level, and for all levels of degradation.)

	Low C Accrual 10 years		Low C Accrual 20 years		Low C Accrual 30 years	
	Total Area	Spekboomveld	Total Area	Spekboomveld	Total Area	Spekboomveld
C price	573 ha's	112 ha's	573 ha's	112 ha's	573 ha's	112 ha's
\$ 5	R 3	R 16	R 2	R 10	R 1	R 6
\$ 10	R 6	R 32	R 4	R 20	R 2	R 12
\$ 15	R 9	R 48	R 6	R 29	R 4	R 18
\$ 20	R 12	R 64	R 8	R 39	R 5	R 24
\$ 25	R 16	R 79	R 10	R 49	R 6	R 30
\$ 30	R 19	R 95	R 11	R 59	R 7	R 36
\$ 40	R 25	R 127	R 15	R 78	R 9	R 48
\$ 50	R 31	R 159	R 19	R 98	R 12	R 60
\$ 75	R 47	R 238	R 29	R 146	R 18	R 90
\$ 100	R 62	R 318	R 38	R 195	R 23	R 120



Educational Trust Property

Table 32. CO₂e accrual sensitivity matrix for the Educational Trust property.

Carbon in t C ha ⁻¹ yr ⁻¹	Time in years		
	10	20	30
1	7	15	22
2	15	30	44
4	30	59	89

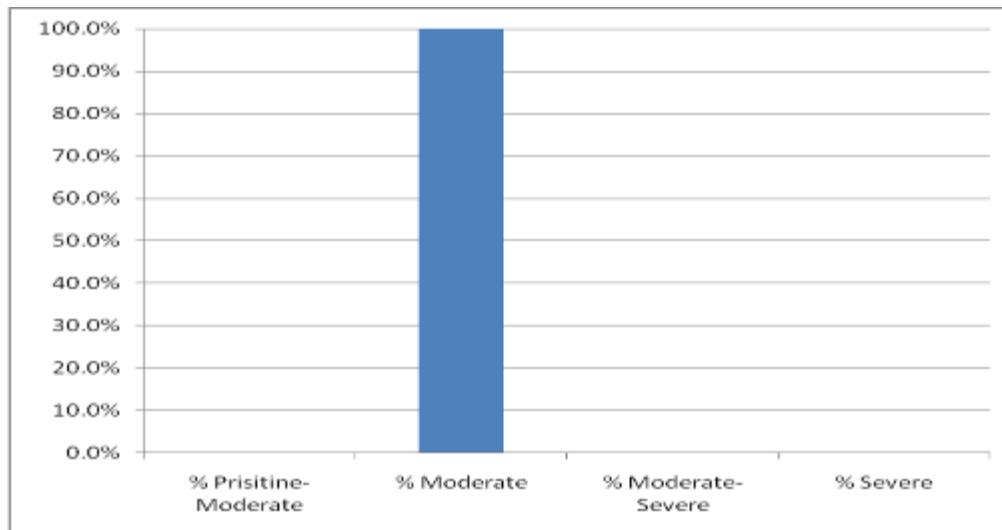


Figure 15. Relative percentages for spekboom-rich vegetation degradation classes for the Educational Trust property.

Table 33. Predicted revenue for carbon credits for the Educational Trust property.

	Low C Accrual	Discounted	Low C Accrual	Discounted	Low C Accrual	Discounted
C price	10 years	@ 5%	20 years	@ 5%	30 years	@ 5%
\$ 5	R 245	R 150	R 525	R 198	R 770	R 178
\$ 10	R 490	R 301	R 1,050	R 396	R 1,540	R 356
\$ 15	R 735	R 451	R 1,575	R 594	R 2,310	R 534
\$ 20	R 980	R 602	R 2,100	R 791	R 3,080	R 713
\$ 25	R 1,225	R 752	R 2,625	R 989	R 3,850	R 891
\$ 30	R 1,470	R 902	R 3,150	R 1,187	R 4,620	R 1,069
\$ 40	R 1,960	R 1,203	R 4,200	R 1,583	R 6,160	R 1,425
\$ 50	R 2,450	R 1,504	R 5,250	R 1,979	R 7,700	R 1,782
\$ 75	R 3,675	R 2,256	R 7,875	R 2,968	R 11,550	R 2,672
\$ 100	R 4,900	R 3,008	R 10,500	R 3,957	R 15,400	R 3,563



Table 34: Carbon credit income revenues for the Educational Trust property (expressed as R ha⁻¹ yr⁻¹ per collective title deeds and per restoration area) based on carbon accrual sensitivity analysis (with conversion factor for % spekboom cover and a conversion factor for degradation level, and for all levels of degradation.)

	Low C Accrual 10 years		Low C Accrual 20 years		Low C Accrual 30 years	
	Total Area	Spekboomveld	Total Area	Spekboomveld	Total Area	Spekboomveld
C price	0.4 ha's	0.4 ha's	0.4 ha's	0.4 ha's	0.4 ha's	0.4 ha's
\$ 5	R 38	R 38	R 25	R 25	R 15	R 15
\$ 10	R 75	R 75	R 49	R 49	R 30	R 30
\$ 15	R 113	R 113	R 74	R 74	R 45	R 45
\$ 20	R 150	R 150	R 99	R 99	R 59	R 59
\$ 25	R 188	R 188	R 124	R 124	R 74	R 74
\$ 30	R 226	R 226	R 148	R 148	R 89	R 89
\$ 40	R 301	R 301	R 198	R 198	R 119	R 119
\$ 50	R 376	R 376	R 247	R 247	R 148	R 148
\$ 75	R 564	R 564	R 371	R 371	R 223	R 223
\$ 100	R 752	R 752	R 495	R 495	R 297	R 297



6.3.7 ERJEE Trust Property

Table 35. CO₂e accrual sensitivity matrix for the ERJEE Trust property.

Carbon in t C ha ⁻¹ yr ⁻¹	Time in years		
	10	20	30
1	1 861	3 722	5 583
2	3 722	7 444	11 167
4	7 444	14 889	22 333

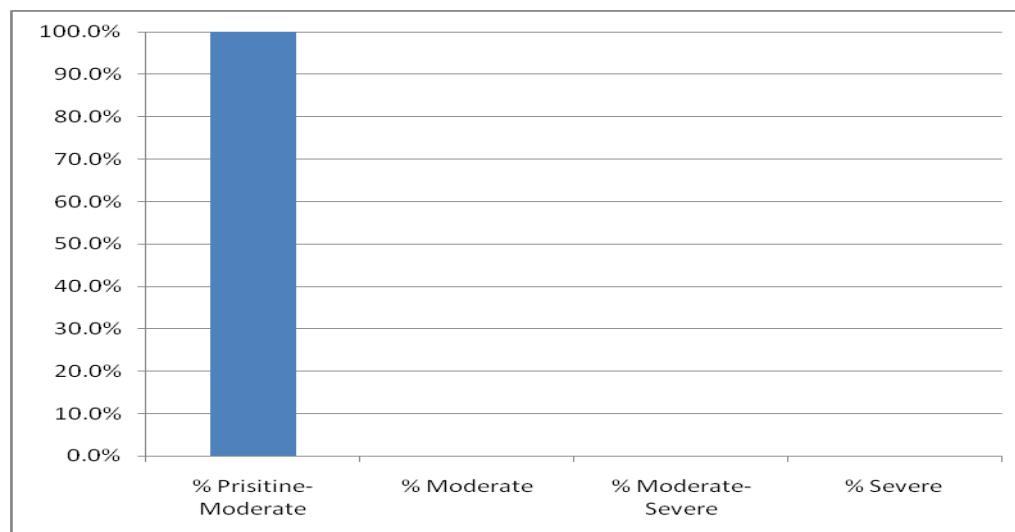


Figure 16. Relative percentages for spekboom-rich vegetation degradation classes for the ERJEE Trust property.

Table 36. Predicted revenue for carbon credits for the ERJEE Trust property.

	Low C Accrual	Discounted	Low C Accrual	Discounted	Low C Accrual	Discounted
C price	10 years	@ 5%	20 years	@ 5%	30 years	@ 5%
\$ 5	R 65,135	R 39,987	R 130,270	R 49,097	R 195,405	R 45,212
\$ 10	R 130,270	R 79,974	R 260,540	R 98,195	R 390,810	R 90,425
\$ 15	R 195,405	R 119,9-62	R 390,810	R 147,292	R 586,215	R 135,637
\$ 20	R 260,540	R 159,949	R 521,080	R 196,390	R 781,620	R 180,849
\$ 25	R 325,675	R 199,936	R 651,350	R 245,487	R 977,025	R 226,062
\$ 30	R 390,810	R 239,923	R 781,620	R 294,584	R 1,172,430	R 271,274
\$ 40	R 521,080	R 319,898	R 1,042,160	R 392,779	R 1,563,240	R 361,698
\$ 50	R 651,350	R 399,872	R 1,302,700	R 490,974	R 1,954,050	R 452,123
\$ 75	R 977,025	R 599,809	R 1,954,050	R 736,461	R 2,931,075	R 678,185
\$ 100	R 1,302,700	R 799,745	R 2,605,400	R 981,948	R 3,908,100	R 904,246



Table 37: Carbon credit income revenues for the ERJEE Trust property (expressed as R ha⁻¹ yr⁻¹ per collective title deeds and per restoration area) based on carbon accrual sensitivity analysis (with conversion factor for % spekboom cover and a conversion factor for degradation level, and *for all levels of degradation*.)

	Low C Accrual 10 years		Low C Accrual 20 years		Low C Accrual 30 years	
	Total Area	Spekboomveld	Total Area	Spekboomveld	Total Area	Spekboomveld
C price	518.8 ha's	251.5 ha's	518.8 ha's	251.5 ha's	518.8 ha's	251.5 ha's
\$ 5	R 8	R 16	R 5	R 10	R 3	R 6
\$ 10	R 15	R 32	R 9	R 19	R 6	R 12
\$ 15	R 23	R 48	R 14	R 29	R 9	R 18
\$ 20	R 31	R 63	R 19	R 39	R 12	R 24
\$ 25	R 39	R 79	R 24	R 49	R 15	R 30
\$ 30	R 46	R 95	R 28	R 58	R 17	R 36
\$ 40	R 62	R 127	R 38	R 78	R 23	R 48
\$ 50	R 77	R 159	R 47	R 97	R 29	R 60
\$ 75	R 116	R 238	R 71	R 146	R 44	R 90
\$ 100	R 154	R 317	R 95	R 195	R 58	R 120

6.3.8 Honey Property

Table 38. CO₂e accrual sensitivity matrix for the Honey property.

Carbon in t C ha ⁻¹ yr ⁻¹	Time in years		
	10	20	30
1	4 024	8 047	12 070
2	8 047	16 095	24 142
4	16 095	32 190	48 284

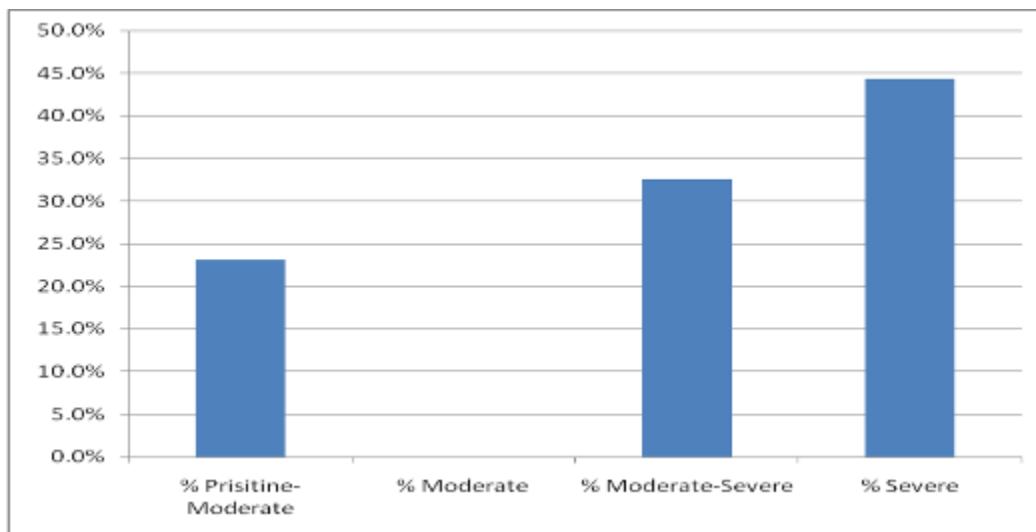


Figure 17. Relative percentages for spekboom-rich vegetation degradation classes for the Honey property.

Table 39. Predicted revenue for carbon credits for the Honey property.

	Low C Accrual	Discounted	Low C Accrual	Discounted	Low C Accrual	Discounted
C price	10 years	@ 5%	20 years	@ 5%	30 years	@ 5%
\$ 5	R 140,840	R 86,464	R 281,645	R 106,149	R 422,450	R 97,745
\$ 10	R 281,680	R 172,927	R 563,290	R 212,298	R 844,900	R 195,491
\$ 15	R 422,520	R 259,391	R 844,935	R 318,447	R 1,267,350	R 293,236
\$ 20	R 563,360	R 345,854	R 1,126,580	R 424,596	R 1,689,800	R 390,982
\$ 25	R 704,200	R 432,318	R 1,408,225	R 530,745	R 2,112,250	R 488,727
\$ 30	R 845,040	R 518,781	R 1,689,870	R 636,894	R 2,534,700	R 586,472
\$ 40	R 1,126,720	R 691,708	R 2,253,160	R 849,192	R 3,379,600	R 781,963
\$ 50	R 1,408,400	R 864,635	R 2,816,450	R 1,061,490	R 4,224,500	R 977,454
\$ 75	R 2,112,600	R 1,296,953	R 4,224,675	R 1,592,236	R 6,336,750	R 1,466,181
\$ 100	R 2,816,800	R 1,729,271	R 5,632,900	R 2,122,981	R 8,449,000	R 1,954,908



Table 40: Carbon credit income revenues for the Honey property (expressed as R ha⁻¹ yr⁻¹ per collective title deeds and per restoration area) based on carbon accrual sensitivity analysis (with conversion factor for % spekboom cover and a conversion factor for degradation level, and *for all levels of degradation.*)

	Low C Accrual 10 years		Low C Accrual 20 years		Low C Accrual 30 years	
	Total Area	Spekboomveld	Total Area	Spekboomveld	Total Area	Spekboomveld
C price	2985 ha's	388 ha's	2985 ha's	388 ha's	2985 ha's	388 ha's
\$ 5	R 3	R 22	R 2	R 14	R 1	R 8
\$ 10	R 6	R 45	R 4	R 27	R 2	R 17
\$ 15	R 9	R 67	R 5	R 41	R 3	R 25
\$ 20	R 12	R 89	R 7	R 55	R 4	R 34
\$ 25	R 14	R 111	R 9	R 68	R 5	R 42
\$ 30	R 17	R 134	R 11	R 82	R 7	R 50
\$ 40	R 23	R 178	R 14	R 109	R 9	R 67
\$ 50	R 29	R 223	R 18	R 137	R 11	R 84
\$ 75	R 43	R 334	R 27	R 205	R 16	R 126
\$ 100	R 58	R 446	R 36	R 274	R 22	R 168

6.3.9 Initiatives SA Inv 71 Pty (Ltd) Property

Table 41. CO₂e accrual sensitivity matrix for the Initiatives SA Inv 71 Pty (Ltd) property.

Carbon in t C ha ⁻¹ yr ⁻¹	Time in years		
	10	20	30
1	21 539	43 076	64 614
2	43 076	86 152	129 228
4	86 152	172 300	258 453

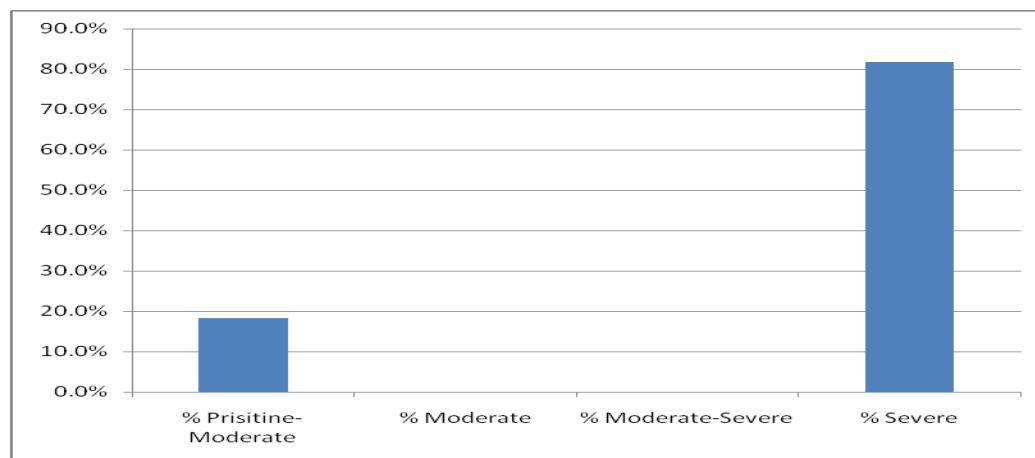


Figure 18. Relative percentages for spekboom-rich vegetation degradation classes for the Initiative SA Inv 71 Pty (Ltd) property.

Table 42. Predicted revenue for carbon credits for the Initiative Inv SA 71 Pty (Ltd) property.

C price	Low C Accrual		Discounted		Low C Accrual		Discounted		Low C Accrual		Discounted	
	10 years	@ 5%	20 years	@ 5%	30 years	@ 5%	10 years	@ 5%	20 years	@ 5%	30 years	@ 5%
\$ 5	R 753,865	R 462,808	R 1,507,660	R 568,221	R 2,261,490	R 523,258						
\$ 10	R 1,507,730	R 925,615	R 3,015,320	R 1,136,442	R 4,522,980	R 1,046,516						
\$ 15	R 2,261,595	R 1,388,423	R 4,522,980	R 1,704,664	R 6,784,470	R 1,569,773						
\$ 20	R 3,015,460	R 1,851,231	R 6,030,640	R 2,272,885	R 9,045,960	R 2,093,031						
\$ 25	R 3,769,325	R 2,314,039	R 7,538,300	R 2,841,106	R 11,307,450	R 2,616,289						
\$ 30	R 4,523,190	R 2,776,846	R 9,045,960	R 3,409,327	R 13,568,940	R 3,139,547						
\$ 40	R 6,030,920	R 3,702,462	R 12,061,280	R 4,545,770	R 18,091,920	R 4,186,062						
\$ 50	R 7,538,650	R 4,628,077	R 15,076,600	R 5,682,212	R 22,614,900	R 5,232,578						
\$ 75	R 11,307,975	R 6,942,116	R 22,614,900	R 8,523,318	R 33,922,350	R 7,848,867						
\$ 100	R 15,077,300	R 9,256,154	R 30,153,200	R 11,364,424	R 45,229,800	R 10,465,156						



Table 43: Carbon credit income revenues for the Initiatives SA Inv 71 Pty (Ltd) property (expressed as R ha⁻¹ yr⁻¹ per collective title deeds and per restoration area) based on carbon accrual sensitivity analysis (with conversion factor for % spekboom cover and a conversion factor for degradation level, and for all levels of degradation.)

	Low C Accrual 10 years		Low C Accrual 20 years		Low C Accrual 30 years	
	Total Area	Spekboomveld	Total Area	Spekboomveld	Total Area	Spekboomveld
C price	2 172 ha's	844 ha's	2 172 ha's	844 ha's	2 172 ha's	844 ha's
\$ 5	R 21	R 55	R 13	R 34	R 8	R 21
\$ 10	R 43	R 110	R 26	R 67	R 16	R 41
\$ 15	R 64	R 165	R 39	R 101	R 24	R 62
\$ 20	R 85	R 219	R 52	R 135	R 32	R 83
\$ 25	R 107	R 274	R 65	R 168	R 40	R 103
\$ 30	R 128	R 329	R 78	R 202	R 48	R 124
\$ 40	R 170	R 439	R 105	R 269	R 64	R 165
\$ 50	R 213	R 548	R 131	R 337	R 80	R 207
\$ 75	R 320	R 823	R 196	R 505	R 120	R 310
\$ 100	R 426	R 1,097	R 262	R 673	R 161	R 413

6.3.10 Lamprechts Trustees Property

Table 44. CO₂e accrual sensitivity matrix for the Lamprechts Trustees property.

Carbon in t C ha ⁻¹ yr ⁻¹	Time in years		
	10	20	30
1	100 374	200 746	301 122
2	200 746	401 493	602 238
4	401 493	802 981	1 204 471

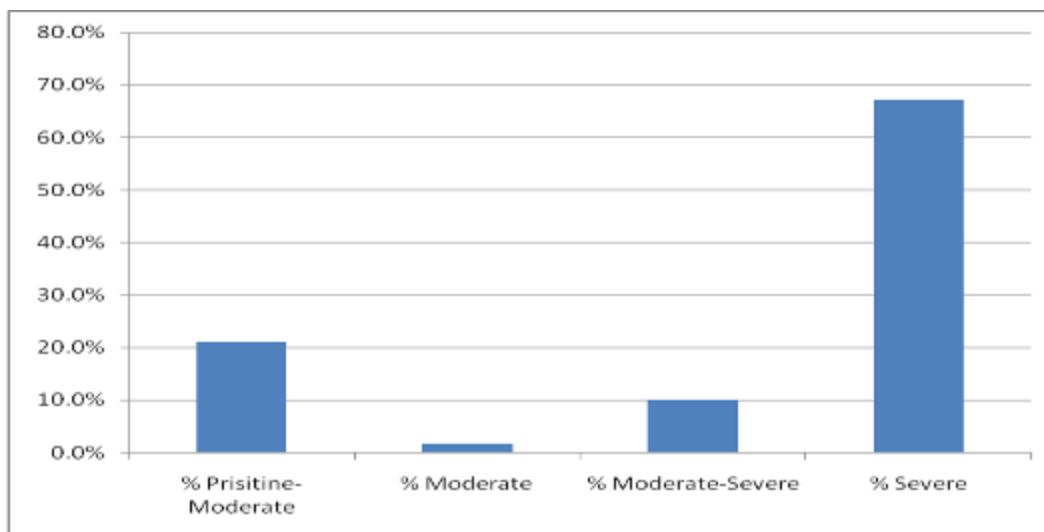


Figure 19. Relative percentages for spekboom-rich vegetation degradation classes for the Lamprechts Trustees property.

Table 45. Predicted revenue for carbon credits for the Lamprechts Trustees property.

	Low C Accrual	Discounted	Low C Accrual	Discounted	Low C Accrual	Discounted
C price	10 years	@ 5%	20 years	@ 5%	30 years	@ 5%
\$ 5	R 3,513,090	R 2,156,733	R 7,026,110	R 2,648,067	R 10,539,270	R 2,438,549
\$ 10	R 7,026,180	R 4,313,465	R 14,052,220	R 5,296,134	R 21,078,540	R 4,877,099
\$ 15	R 10,539,270	R 6,470,198	R 21,078,330	R 7,944,201	R 31,617,810	R 7,315,648
\$ 20	R 14,052,360	R 8,626,930	R 28,104,440	R 10,592,268	R 42,157,080	R 9,754,198
\$ 25	R 17,565,450	R 10,783,663	R 35,130,550	R 13,240,335	R 52,696,350	R 12,192,747
\$ 30	R 21,078,540	R 12,940,395	R 42,156,660	R 15,888,402	R 63,235,620	R 14,631,296
\$ 40	R 28,104,720	R 17,253,860	R 56,208,880	R 21,184,536	R 84,314,160	R 19,508,395
\$ 50	R 35,130,900	R 21,567,325	R 70,261,100	R 26,480,670	R 105,392,700	R 24,385,494
\$ 75	R 52,696,350	R 32,350,988	R 105,391,650	R 39,721,004	R 158,089,050	R 36,578,241
\$ 100	R 70,261,800	R 43,134,650	R 140,522,200	R 52,961,339	R 210,785,400	R 48,770,988



Table 46: Carbon credit income revenues for the Lamprechts Trustees property (expressed as R ha⁻¹ yr⁻¹ per collective title deeds and per restoration area) based on carbon accrual sensitivity analysis (with conversion factor for % spekboom cover and a conversion factor for degradation level, and for all levels of degradation.)

	Low C Accrual 10 years		Low C Accrual 20 years		Low C Accrual 30 years	
	Total Area	Spekboomveld	Total Area	Spekboomveld	Total Area	Spekboomveld
C price	9 887 ha's	4 137 ha's	9 887 ha's	4 137 ha's	9 887 ha's	4 137 ha's
\$ 5	R 22	R 52	R 13	R 32	R 8	R 20
\$ 10	R 44	R 104	R 27	R 64	R 16	R 39
\$ 15	R 65	R 156	R 40	R 96	R 25	R 59
\$ 20	R 87	R 209	R 54	R 128	R 33	R 79
\$ 25	R 109	R 261	R 67	R 160	R 41	R 98
\$ 30	R 131	R 313	R 80	R 192	R 49	R 118
\$ 40	R 175	R 417	R 107	R 256	R 66	R 157
\$ 50	R 218	R 521	R 134	R 320	R 82	R 196
\$ 75	R 327	R 782	R 201	R 480	R 123	R 295
\$ 100	R 436	R 1,043	R 268	R 640	R 164	R 393

6.3.11 Lezmin 2098 CC Property

Table 47. CO₂e accrual sensitivity matrix for the Lezmin 2098 CC property.

Carbon in t C ha ⁻¹ yr ⁻¹	Time in years		
	10	20	30
1	1 378	2 757	4 136
2	2 757	5 514	8 272
4	5 514	11 029	16 543

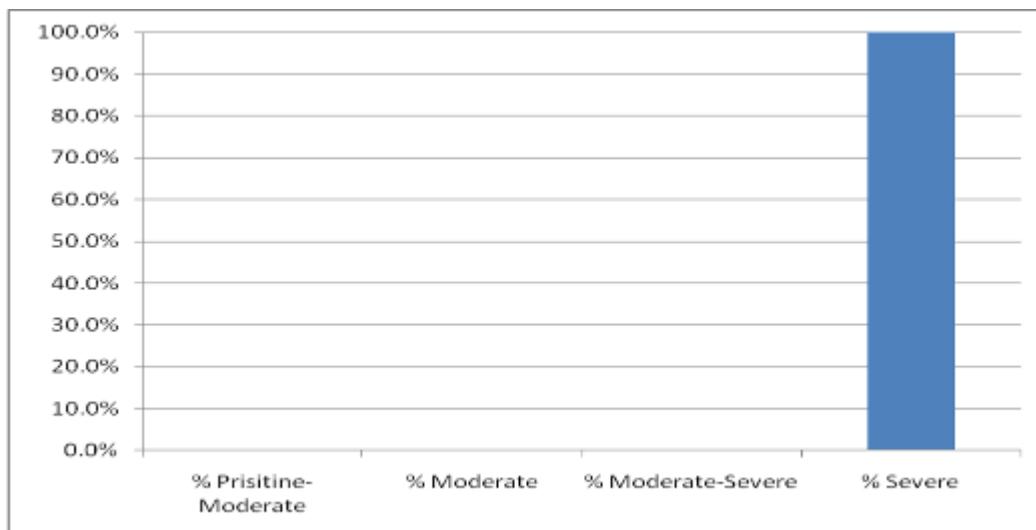


Figure 20. Relative percentages for spekboom-rich vegetation degradation classes for the Lezmin 2098 CC property.

Table 48. Predicted revenue for carbon credits for the Lezmin 2098 CC property.

	Low C Accrual	Discounted	Low C Accrual	Discounted	Low C Accrual	Discounted
C price	10 years	@ 5%	20 years	@ 5%	30 years	@ 5%
\$ 5	R 48,230	R29,609	R 96,495	R 36,368	R144,760	R33,494
\$ 10	R 96,460	R59,218	R 192,990	R 72,736	R289,520	R66,988
\$ 15	R144,690	R 88,827	R 289,485	R 109,104	R 434,280	R100,483
\$ 20	R192,920	R118,436	R 385,980	R 145,472	R579,040	R133,977
\$ 25	R241,150	R148,045	R 482,475	R 181,840	R723,800	R167,471
\$ 30	R289,380	R 177,654	R578,970	R 218,208	R868,560	R200,965
\$ 40	R385,840	R236,872	R771,960	R 290,944	R1,158,080	R267,954
\$ 50	R482,300	R296,090	R 964,950	R363,680	R1,447,600	R334,942
\$ 75	R723,450	R444,136	R1,447,425	R 545,519	R2,171,400	R502,413
\$ 100	R964,600	R592,181	R 1,929,900	R 727,359	R2,895,200	R669,884



Table 49: Carbon credit income revenues for the Lezmin 2098 CC property (expressed as R ha⁻¹ yr⁻¹ per collective title deeds and per restoration area) based on carbon accrual sensitivity analysis (with conversion factor for % spekboom cover and a conversion factor for degradation level, and for all levels of degradation.)

	Low C Accrual 10 years		Low C Accrual 20 years		Low C Accrual 30 years	
	Total Area	Spekboomveld	Total Area	Spekboomveld	Total Area	Spekboomveld
C price	2 604 ha's	186 ha's	2 604 ha's	186 ha's	2 604 ha's	186 ha's
\$ 5	R 1	R 16	R 1	R 10	R 0	R 6
\$ 10	R 2	R 32	R 1	R 20	R 1	R 12
\$ 15	R 3	R 48	R 2	R 29	R 1	R 18
\$ 20	R 5	R 64	R 3	R 39	R 2	R 24
\$ 25	R 6	R 80	R 3	R 49	R 2	R 30
\$ 30	R 7	R 96	R 4	R 59	R 3	R 36
\$ 40	R 9	R 127	R 6	R 78	R 3	R 48
\$ 50	R 11	R 159	R 7	R 98	R 4	R 60
\$ 75	R 17	R 239	R 10	R 147	R 6	R 90
\$ 100	R 23	R 318	R 14	R 196	R 9	R 120



6.3.12 Nederduits Gereformeerde Kerk Property

Table 50. CO₂e accrual sensitivity matrix for the Nederduits Gereformeerde Kerk property.

Carbon in t C ha ⁻¹ yr ⁻¹	Time in years		
	10	20	30
1	28	57	85
2	57	114	171
4	114	228	342

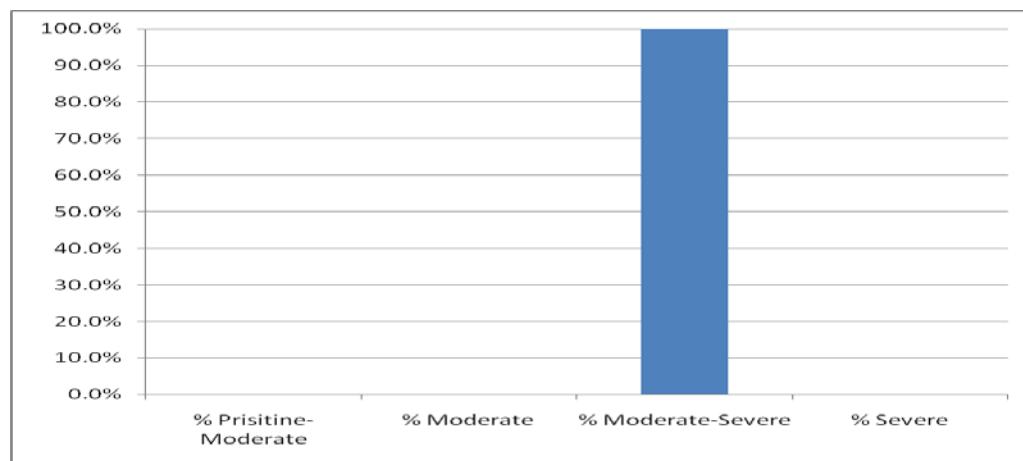


Figure 21. Relative percentages for spekboom-rich vegetation degradation classes for the Nederduits Gereformeerde Kerk property.

Table 51. Predicted revenue for carbon credits for the Nederduits Gereformeerde Kerk property.

	Low C Accrual	Discounted	Low C Accrual	Discounted	Low C Accrual	Discounted
C price	10 years	@ 5%	20 years	@ 5%	30 years	@ 5%
\$5	R 980	R602	R1,995	R752	R2,975	R688
\$10	R1,960	R1,203	R3,990	R1,504	R5,950	R1,377
\$15	R2,940	R1,805	R5,985	R2,256	R8,925	R2,065
\$20	R3,920	R2,407	R7,980	R3,008	R11,900	R2,753
\$25	R4,900	R3,008	R9,975	R3,759	R14,875	R3,442
\$30	R5,880	R3,610	R11,970	R4,511	R17,850	R4,130
\$40	R7,840	R4,813	R15,960	R6,015	R23,800	R5,507
\$50	R9,800	R6,016	R19,950	R7,519	R29,750	R6,883
\$75	R 14,700	R9,025	R 29,925	R 11,278	R44,625	R10,325
\$100	R19,600	R12,033	R39,900	R15,038	0 R59,500	R13,767



Table 52: Carbon credit income revenues for the Nederduits Gereformeerde Kerk property (expressed as R ha⁻¹ yr⁻¹ per collective title deeds and per restoration area) based on carbon accrual sensitivity analysis (with conversion factor for % spekboom cover and a conversion factor for degradation level, and for all levels of degradation.)

	Low C Accrual 10 years		Low C Accrual 20 years		Low C Accrual 30 years	
	Total Area	Spekboomveld	Total Area	Spekboomveld	Total Area	Spekboomveld
C price	3.1 ha's	2.2 ha's	3.1 ha's	2.2 ha's	3.1 ha's	2.2 ha's
\$ 5	R 19	R 27	R 12	R 17	R 7	R 10
\$ 10	R 39	R 55	R 24	R 34	R 15	R 21
\$ 15	R 58	R 82	R 36	R 51	R 22	R 31
\$ 20	R 78	R 109	R 49	R 68	R 30	R 42
\$ 25	R 97	R 137	R 61	R 85	R 37	R 52
\$ 30	R 116	R 164	R 73	R 103	R 44	R 63
\$ 40	R 155	R 219	R 97	R 137	R 59	R 83
\$ 50	R 194	R 273	R 121	R 171	R 74	R 104
\$ 75	R 291	R 410	R 182	R 256	R 111	R 156
\$ 100	R 388	R 547	R 243	R 342	R 148	R 209



6.3.13 Nortje Property

Table 53. CO₂e accrual sensitivity matrix for the Nortje property.

Carbon in t C ha ⁻¹ yr ⁻¹	Time in years		
	10	20	30
1	1 541	3 081	4 622
2	3 081	6 163	9 244
4	6 163	12 325	18 488

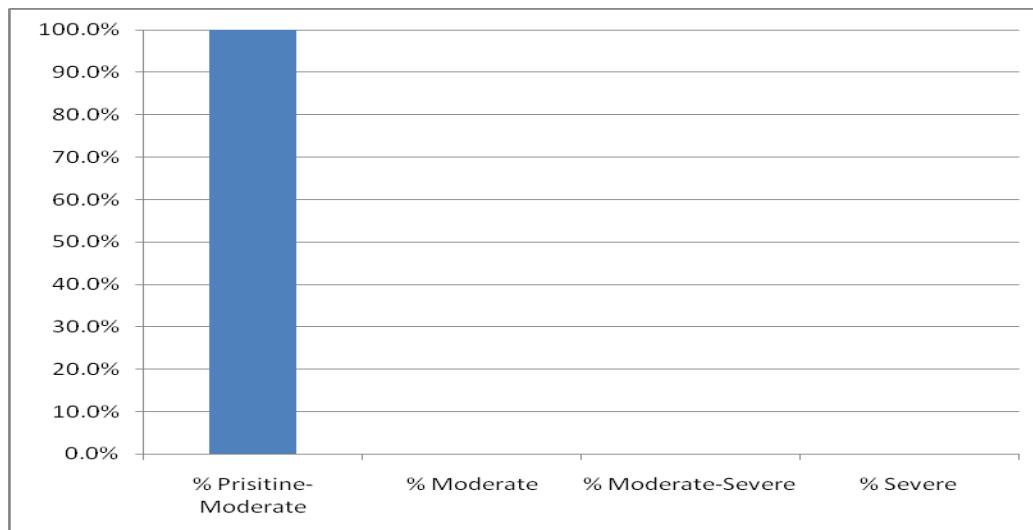


Figure 22. Relative percentages for spekboom-rich vegetation degradation classes for the Nortje property.

Table 54. Predicted revenue for carbon credits for the Nortje property.

	Low C Accrual	Discounted	Low C Accrual	Discounted	Low C Accrual	Discounted
C price	10 years	@ 5%	20 years	@ 5%	30 years	@ 5%
\$ 5	R 53,935	R 33,111	R 107,835	R 40,642	R 161,770	R 37,430
\$ 10	R 107,870	R 66,223	R 215,670	R 81,284	R 323,540	R 74,860
\$ 15	R 161,805	R 99,334	R 323,505	R 121,926	R 485,310	R 112,290
\$ 20	R 215,740	R 132,446	R 431,340	R 162,568	R 647,080	R 149,720
\$ 25	R 269,675	R 165,557	R 539,175	R 203,209	R 808,850	R 187,150
\$ 30	R 323,610	R 198,668	R 647,010	R 243,851	R 970,620	R 224,580
\$ 40	R 431,480	R 264,891	R 862,680	R 325,135	R 1,294,160	R 299,439
\$ 50	R 539,350	R 331,114	R 1,078,350	R 406,419	R 1,617,700	R 374,299
\$ 75	R 809,025	R 496,671	R 1,617,525	R 609,628	R 2,426,550	R 561,449
\$ 100	R 1,078,700	R 662,228	R 2,156,700	R 812,838	R 3,235,400	R 748,599



Table 55: Carbon credit income revenues for the Nortje property (expressed as R ha⁻¹ yr⁻¹ per collective title deeds and per restoration area) based on carbon accrual sensitivity analysis (with conversion factor for % spekboom cover and a conversion factor for degradation level, and *for all levels of degradation*.)

	Low C Accrual 10 years		Low C Accrual 20 years		Low C Accrual 30 years	
	Total Area	Spekboomveld	Total Area	Spekboomveld	Total Area	Spekboomveld
C price	4 096 ha's	104 ha's	4 096 ha's	104 ha's	4 096 ha's	104 ha's
\$ 5	R 1	R 32	R 0	R 20	R 0	R 12
\$ 10	R 2	R 64	R 1	R 39	R 1	R 24
\$ 15	R 2	R 96	R 1	R 59	R 1	R 36
\$ 20	R 3	R 127	R 2	R 78	R 1	R 48
\$ 25	R 4	R 159	R 2	R 98	R 2	R 60
\$ 30	R 5	R 191	R 3	R 117	R 2	R 72
\$ 40	R 6	R 255	R 4	R 156	R 2	R 96
\$ 50	R 8	R 318	R 5	R 195	R 3	R 120
\$ 75	R 12	R 478	R 7	R 293	R 5	R 180
\$ 100	R 16	R 637	R 10	R 391	R 6	R 240

6.3.14 Reyneke Property

Table 56. CO₂e accrual sensitivity matrix for the Reyneke property.

Carbon in t C ha ⁻¹ yr ⁻¹	Time in years		
	10	20	30
1	1 500	2 998	4 498
2	2 998	5 997	8 995
4	5 997	11 994	17 990

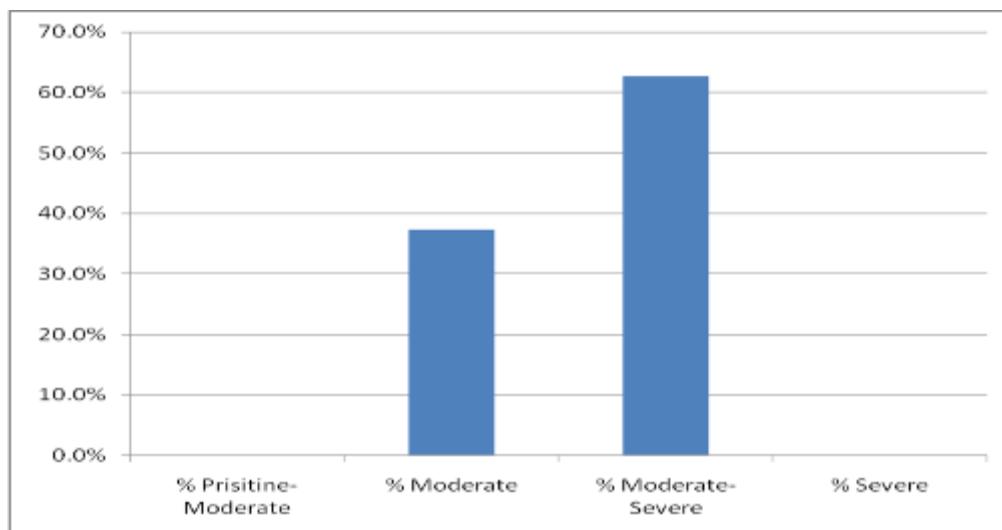


Figure 23. Relative percentages for spekboom-rich vegetation degradation classes for the Reyneke property.

Table 57. Predicted revenue for carbon credits for the Reyneke property

	Low C Accrual	Discounted	Low C Accrual	Discounted	Low C Accrual	Discounted
C price	10 years	@ 5%	20 years	@ 5%	30 years	@ 5%
\$ 5	R 52,500	R 32,230	R 104,930	R 39,547	R 157,430	R 36,426
\$ 10	R 105,000	R 64,461	R 209,860	R 79,094	R 314,860	R 72,852
\$ 15	R 157,500	R 96,691	R 314,790	R 118,641	R 472,290	R 109,277
\$ 20	R 210,000	R 128,922	R 419,720	R 158,188	R 629,720	R 145,703
\$ 25	R 262,500	R 161,152	R 524,650	R 197,735	R 787,150	R 182,129
\$ 30	R 315,000	R 193,383	R 629,580	R 237,282	R 944,580	R 218,555
\$ 40	R 420,000	R 257,844	R 839,440	R 316,376	R 1,259,440	R 291,406
\$ 50	R 525,000	R 322,304	R 1,049,300	R 395,470	R 1,574,300	R 364,258
\$ 75	R 787,500	R 483,457	R 1,573,950	R 593,205	R 2,361,450	R 546,386
\$ 100	R 1,050,000	R 644,609	R 2,098,600	R 790,940	R 3,148,600	R 728,515



Table 58: Carbon credit income revenues for the Reyneke property (expressed as R ha⁻¹ yr⁻¹ per collective title deeds and per restoration area) based on carbon accrual sensitivity analysis (with conversion factor for % spekboom cover and a conversion factor for degradation level, and *for all levels of degradation*.)

	Low C Accrual 10 years		Low C Accrual 20 years		Low C Accrual 30 years	
	Total Area	Spekboomveld	Total Area	Spekboomveld	Total Area	Spekboomveld
C price	500 ha's	130 ha's	500 ha's	130 ha's	500 ha's	130 ha's
\$ 5	R 6	R 25	R 4	R 15	R 2	R 9
\$ 10	R 13	R 50	R 8	R 30	R 5	R 19
\$ 15	R 19	R 74	R 12	R 46	R 7	R 28
\$ 20	R 26	R 99	R 16	R 61	R 10	R 37
\$ 25	R 32	R 124	R 20	R 76	R 12	R 47
\$ 30	R 39	R 149	R 24	R 91	R 15	R 56
\$ 40	R 52	R 198	R 32	R 122	R 19	R 75
\$ 50	R 64	R 248	R 40	R 152	R 24	R 93
\$ 75	R 97	R 372	R 59	R 228	R 36	R 140
\$ 100	R 129	R 496	R 79	R 304	R 49	R 187



6.3.15 Rooikloof CC Property

Table 59. CO₂e accrual sensitivity matrix for the Rooikloof CC property.

Carbon in t C ha ⁻¹ yr ⁻¹	Time in years		
	10	20	30
1	4 780	9 562	14 341
2	9 562	19 121	28 683
4	19 121	38 244	57 365

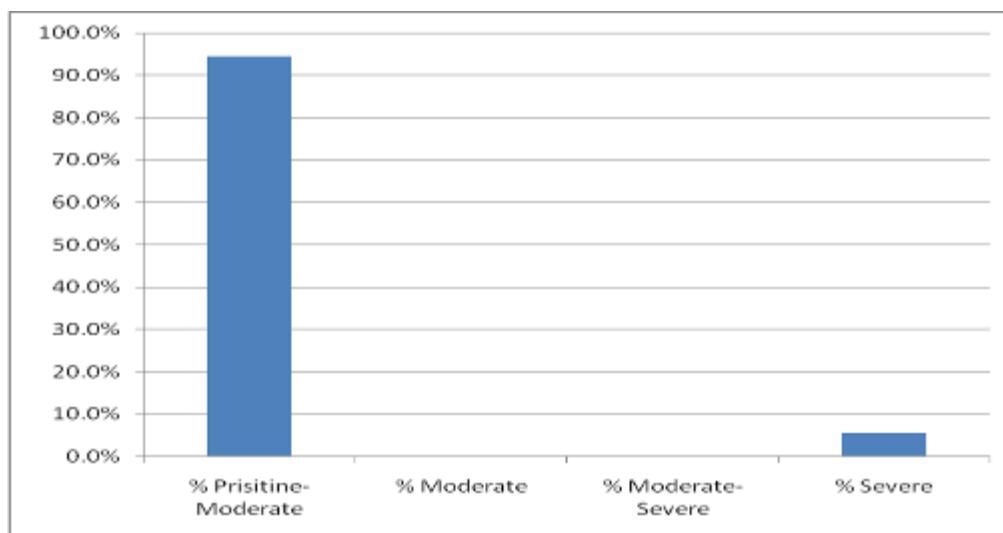


Figure 24. Relative percentages for spekboom-rich vegetation degradation classes for the Rooikloof CC property.

Table 60. Predicted revenue for carbon credits for the Rooikloof CC property.

	Low C Accrual	Discounted	Low C Accrual	Discounted	Low C Accrual	Discounted
C price	10 years	@ 5%	20 years	@ 5%	30 years	@ 5%
\$ 5	R 167,300	R 102,708	R 334,670	R 126,134	R 501,935	R 116,136
\$ 10	R 334,600	R 205,415	R 669,340	R 252,267	R 1,003,870	R 232,273
\$ 15	R 501,900	R 308,123	R 1,004,010	R 378,401	R 1,505,805	R 348,409
\$ 20	R 669,200	R 410,831	R 1,338,680	R 504,534	R 2,007,740	R 464,546
\$ 25	R 836,500	R 513,538	R 1,673,350	R 630,668	R 2,509,675	R 580,682
\$ 30	R 1,003,800	R 616,246	R 2,008,020	R 756,802	R 3,011,610	R 696,819
\$ 40	R 1,338,400	R 821,661	R 2,677,360	R 1,009,069	R 4,015,480	R 929,092
\$ 50	R 1,673,000	R 1,027,077	R 3,346,700	R 1,261,336	R 5,019,350	R 1,161,364
\$ 75	R 2,509,500	R 1,540,615	R 5,020,050	R 1,892,004	R 7,529,025	R 1,742,047
\$ 100	R 3,346,000	R 2,054,154	R 6,693,400	R 2,522,672	R 10,038,700	R 2,322,729



Table 61: Carbon credit income revenues for the Rooikloof CC property (expressed as R ha⁻¹ yr⁻¹ per collective title deeds and per restoration area) based on carbon accrual sensitivity analysis (with conversion factor for % spekboom cover and a conversion factor for degradation level, and for all levels of degradation.)

	Low C Accrual 10 years		Low C Accrual 20 years		Low C Accrual 30 years	
	Total Area	Spekboomveld	Total Area	Spekboomveld	Total Area	Spekboomveld
C price	578 ha's	314 ha's	578 ha's	314 ha's	578 ha's	314 ha's
\$ 5	578	314	578	314	578	314
\$ 10	R 18	R 33	R 11	R 20	R 7	R 12
\$ 15	R 36	R 65	R 22	R 40	R 13	R 25
\$ 20	R 53	R 98	R 33	R 60	R 20	R 37
\$ 25	R 71	R 131	R 44	R 80	R 27	R 49
\$ 30	R 89	R 164	R 55	R 100	R 33	R 62
\$ 40	R 107	R 196	R 65	R 121	R 40	R 74
\$ 50	R 142	R 262	R 87	R 161	R 54	R 99
\$ 75	R 178	R 327	R 109	R 201	R 67	R 123
\$ 100	R 267	R 491	R 164	R 301	R 100	R 185

6.3.16 Sewefontein Gemeenskap Boerdery Trust Property

Table 62. CO₂e accrual sensitivity matrix for the Sewefontein Gemeenskap Boerdery Trust property.

Carbon in t C ha ⁻¹ yr ⁻¹	Time in years		
	10	20	30
1	12 703	25 409	38 113
2	25 409	50 818	76 227
4	50 818	101 636	152 451

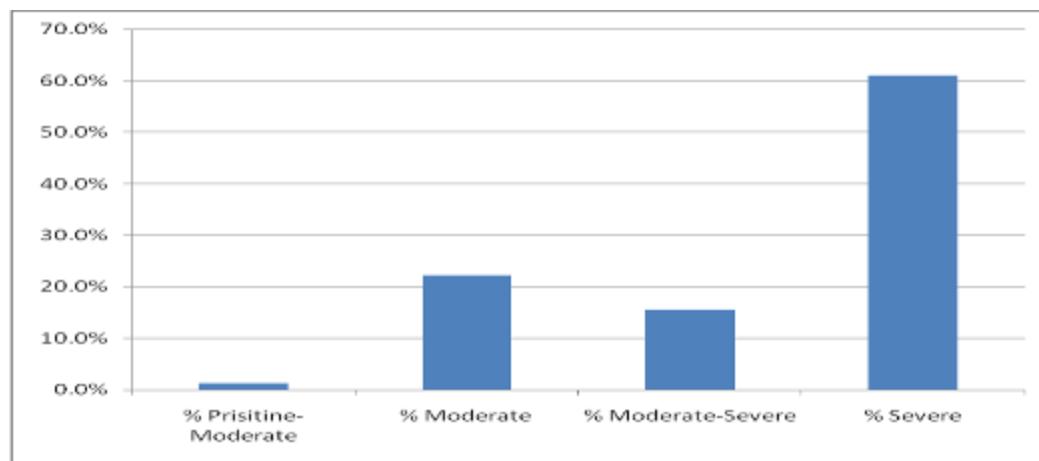


Figure 25.

Relative percentages for spekboom-rich vegetation degradation classes for the Sewefontein Gemeenskap Boerdery Trust property.

Table 63. Predicted revenue for carbon credits for the Sewefontein Gemeenskap Boerdery Trust property.

C price	Low C Accrual		Discounted		Low C Accrual		Discounted	
	10 years	@ 5%	20 years	@ 5%	30 years	@ 5%	10 years	@ 5%
\$ 5	R 444,605	R 272,949	R 889,315	R 335,173	R 1,333,955	R 308,647		
\$ 10	R 889,210	R 545,898	R 1,778,630	R 670,347	R 2,667,910	R 617,294		
\$ 15	R 1,333,815	R 818,847	R 2,667,945	R 1,005,520	R 4,001,865	R 925,941		
\$ 20	R 1,778,420	R 1,091,796	R 3,557,260	R 1,340,694	R 5,335,820	R 1,234,588		
\$ 25	R 2,223,025	R 1,364,745	R 4,446,575	R 1,675,867	R 6,669,775	R 1,543,236		
\$ 30	R 2,667,630	R 1,637,693	R 5,335,890	R 2,011,041	R 8,003,730	R 1,851,883		
\$ 40	R 3,556,840	R 2,183,591	R 7,114,520	R 2,681,388	R 10,671,640	R 2,469,177		
\$ 50	R 4,446,050	R 2,729,489	R 8,893,150	R 3,351,735	R 13,339,550	R 3,086,471		
\$ 75	R 6,669,075	R 4,094,234	R 13,339,725	R 5,027,602	R 20,009,325	R 4,629,707		
\$ 100	R 8,892,100	R 5,458,978	R 17,786,300	R 6,703,469	R 26,679,100	R 6,172,942		



Table 64: Carbon credit income revenues for the Sewefontein Gemenskap Boerdery Trust property (expressed as R ha⁻¹ yr⁻¹ per collective title deeds and per restoration area) based on carbon accrual sensitivity analysis (with conversion factor for % spekboom cover and a conversion factor for degradation level, and for all levels of degradation.)

	Low C Accrual 10 years		Low C Accrual 20 years		Low C Accrual 30 years	
	Total Area	Spekboomveld	Total Area	Spekboomveld	Total Area	Spekboomveld
C price	1 410 ha's	529 ha's	1 410 ha's	529 ha's	1 410 ha's	529 ha's
\$ 5	R 19	R 52	R 12	R 32	R 7	R 19
\$ 10	R 39	R 103	R 24	R 63	R 15	R 39
\$ 15	R 58	R 155	R 36	R 95	R 22	R 58
\$ 20	R 77	R 206	R 48	R 127	R 29	R 78
\$ 25	R 97	R 258	R 59	R 158	R 36	R 97
\$ 30	R 116	R 310	R 71	R 190	R 44	R 117
\$ 40	R 155	R 413	R 95	R 253	R 58	R 156
\$ 50	R 194	R 516	R 119	R 317	R 73	R 194
\$ 75	R 290	R 774	R 178	R 475	R 109	R 292
\$ 100	R 387	R 1,032	R 238	R 634	R 146	R 389

6.3.17 Smith D Property

Table 65. CO₂e accrual sensitivity matrix for the Smith D property.

Carbon in t C ha ⁻¹ yr ⁻¹	Time in years		
	10	20	30
1	13 732	27 462	41 193
2	27 462	54 924	82 384
4	54 924	109 845	164 772

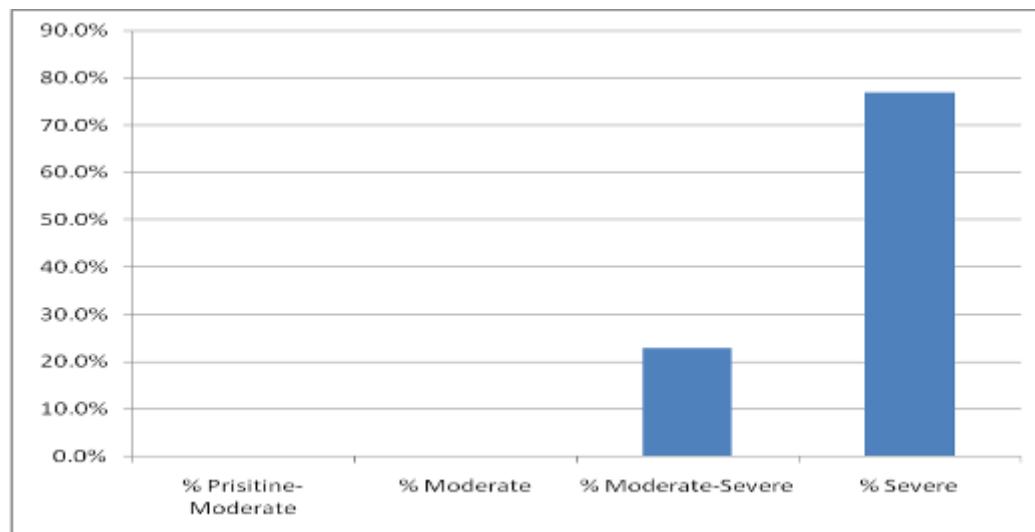


Figure 26.

Relative percentages for spekboom-rich vegetation degradation classes for the Smith D property.

Table 66. Predicted revenue for carbon credits for the Smith D property.

	Low C Accrual	Discounted	Low C Accrual	Discounted	Low C Accrual	Discounted
C price	10 years	@ 5%	20 years	@ 5%	30 years	@ 5%
\$ 5	R 480,620	R 295,059	R 961,170	R 362,255	R 1,441,755	R 333,590
\$ 10	R 961,240	R 590,118	R 1,922,340	R 724,510	R 2,883,510	R 667,179
\$ 15	R 1,441,860	R 885,177	R 2,883,510	R 1,086,765	R 4,325,265	R 1,000,769
\$ 20	R 1,922,480	R 1,180,236	R 3,844,680	R 1,449,019	R 5,767,020	R 1,334,358
\$ 25	R 2,403,100	R 1,475,295	R 4,805,850	R 1,811,274	R 7,208,775	R 1,667,948
\$ 30	R 2,883,720	R 1,770,354	R 5,767,020	R 2,173,529	R 8,650,530	R 2,001,538
\$ 40	R 3,844,960	R 2,360,472	R 7,689,360	R 2,898,039	R 11,534,040	R 2,668,717
\$ 50	R 4,806,200	R 2,950,590	R 9,611,700	R 3,622,549	R 14,417,550	R 3,335,896
\$ 75	R 7,209,300	R 4,425,885	R 14,417,550	R 5,433,823	R 21,626,325	R 5,003,844
\$ 100	R 9,612,400	R 5,901,180	R 19,223,400	R 7,245,097	R 28,835,100	R 6,671,792



Table 67: Carbon credit income revenues for the Smith D property (expressed as R ha⁻¹ yr⁻¹ per collective title deeds and per restoration area) based on carbon accrual sensitivity analysis (with conversion factor for % spekboom cover and a conversion factor for degradation level, and *for all levels of degradation.*)

	Low C Accrual 10 years		Low C Accrual 20 years		Low C Accrual 30 years	
	Total Area	Spekboomveld	Total Area	Spekboomveld	Total Area	Spekboomveld
C price	548 ha's	533 ha's	548 ha's	533 ha's	548 ha's	533 ha's
\$ 5	R 54	R 55	R 33	R 34	R 20	R 21
\$ 10	R 108	R 111	R 66	R 68	R 41	R 42
\$ 15	R 162	R 166	R 99	R 102	R 61	R 63
\$ 20	R 215	R 221	R 132	R 136	R 81	R 83
\$ 25	R 269	R 277	R 165	R 170	R 101	R 104
\$ 30	R 323	R 332	R 198	R 204	R 122	R 125
\$ 40	R 431	R 443	R 264	R 272	R 162	R 167
\$ 50	R 538	R 554	R 331	R 340	R 203	R 209
\$ 75	R 808	R 830	R 496	R 510	R 304	R 313
\$ 100	R 1,077	R 1,107	R 661	R 680	R 406	R 417



6.3.18 Smith N Property

Table 68. CO₂e accrual sensitivity matrix for the Smith N property.

Carbon in t C ha ⁻¹ yr ⁻¹	Time in years		
	10	20	30
1	645	1 288	1 933
2	1 288	2 579	3 867
4	2 579	5 156	7 735

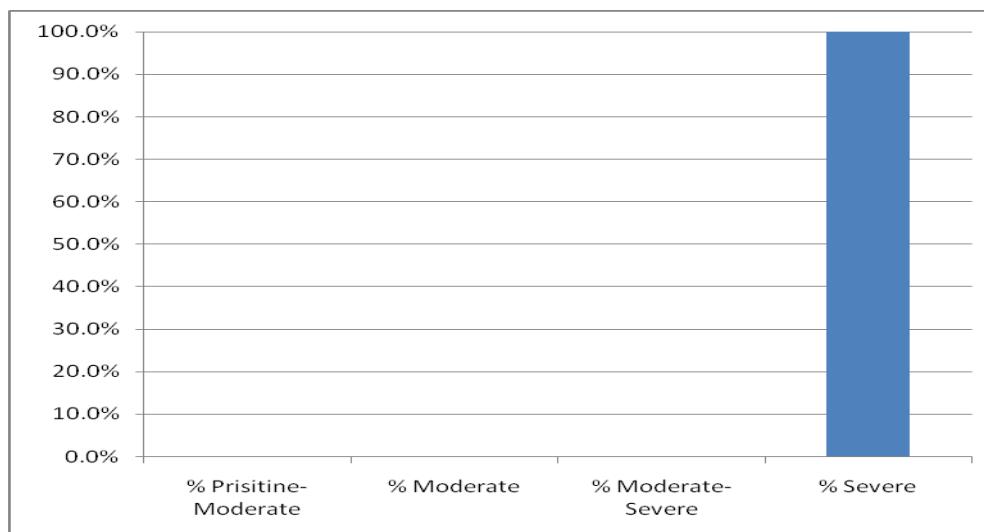


Figure 27. Relative percentages for spekboom-rich vegetation degradation classes for the Smith N property.

Table 69. Predicted revenue for carbon credits for the Smith N property.

	Low C Accrual	Discounted	Low C Accrual	Discounted	Low C Accrual	Discounted
C price	10 years	@ 5%	20 years	@ 5%	30 years	@ 5%
\$ 5	R 22,575	R 13,859	R 45,080	R 16,990	R 67,655	R 15,654
\$ 10	R 45,150	R 27,718	R 90,160	R 33,980	R 135,310	R 31,308
\$ 15	R 67,725	R 41,577	R 135,240	R 50,971	R 202,965	R 46,962
\$ 20	R 90,300	R 55,436	R 180,320	R 67,961	R 270,620	R 62,615
\$ 25	R 112,875	R 69,295	R 225,400	R 84,951	R 338,275	R 78,269
\$ 30	R 135,450	R 83,155	R 270,480	R 101,941	R 405,930	R 93,923
\$ 40	R 180,600	R 110,873	R 360,640	R 135,921	R 541,240	R 125,231
\$ 50	R 225,750	R 138,591	R 450,800	R 169,902	R 676,550	R 156,538
\$ 75	R 338,625	R 207,886	R 676,200	R 254,853	R 1,014,825	R 234,808
\$ 100	R 451,500	R 277,182	R 901,600	R 339,804	R 1,353,100	R 313,077



Table 70: Carbon credit income revenues for the Smith N property (expressed as R ha⁻¹ yr⁻¹ per collective title deeds and per restoration area) based on carbon accrual sensitivity analysis (with conversion factor for % spekboom cover and a conversion factor for degradation level, and *for all levels of degradation*.)

	Low C Accrual 10 years		Low C Accrual 20 years		Low C Accrual 30 years	
	Total Area	Spekboomveld	Total Area	Spekboomveld	Total Area	Spekboomveld
C price	3928 ha's	87 ha's	3928 ha's	87 ha's	3928 ha's	87 ha's
\$ 5	R 0	R 16	R 0	R 10	R 0	R 6
\$ 10	R 1	R 32	R 0	R 20	R 0	R 12
\$ 15	R 1	R 48	R 1	R 29	R 0	R 18
\$ 20	R 1	R 64	R 1	R 39	R 1	R 24
\$ 25	R 2	R 80	R 1	R 49	R 1	R 30
\$ 30	R 2	R 96	R 1	R 59	R 1	R 36
\$ 40	R 3	R 127	R 2	R 78	R 1	R 48
\$ 50	R 4	R 159	R 2	R 98	R 1	R 60
\$ 75	R 5	R 239	R 3	R 146	R 2	R 90
\$ 100	R 7	R 319	R 4	R 195	R 3	R 120



6.3.19 Terblanche Property

Table 71. CO₂e accrual sensitivity matrix for the Terblanche property.

Carbon in t C ha ⁻¹ yr ⁻¹	Time in years		
	10	20	30
1	3 378	6 753	10 130
2	6 753	13 506	20 260
4	13 506	27 012	40 518

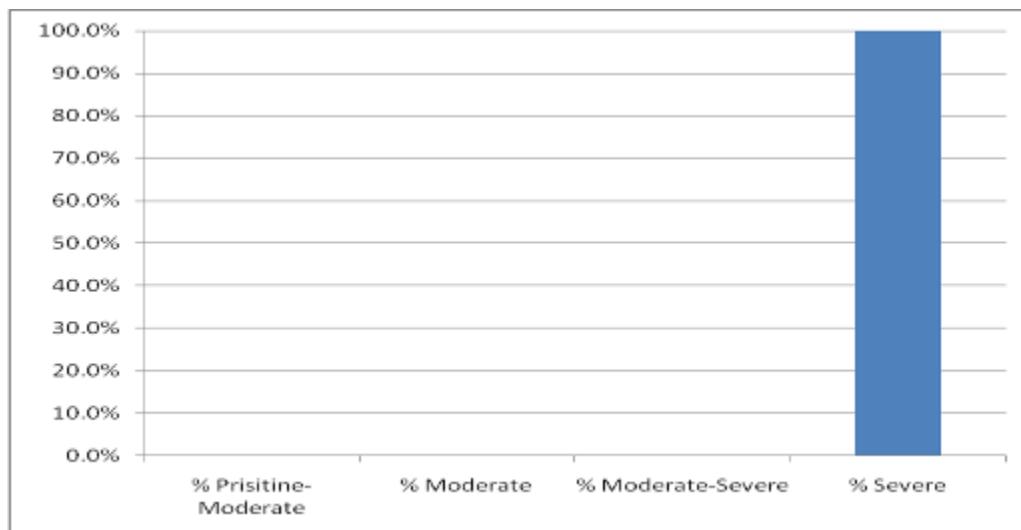


Figure 28. Relative percentages for spekboom-rich vegetation degradation classes for the Terblanche property.

Table 72. Predicted revenue for carbon credits for the Terblanche property.

	Low C Accrual	Discounted	Low C Accrual	Discounted	Low C Accrual	Discounted
C price	10 years	@ 5%	20 years	@ 5%	30 years	@ 5%
\$ 5	R 118,230	R 72,583	R 236,355	R 89,080	R 354,550	R 82,035
\$ 10	R 236,460	R 145,166	R 472,710	R 178,159	R 709,100	R 164,070
\$ 15	R 354,690	R 217,749	R 709,065	R 267,239	R 1,063,650	R 246,105
\$ 20	R 472,920	R 290,332	R 945,420	R 356,319	R 1,418,200	R 328,139
\$ 25	R 591,150	R 362,915	R 1,181,775	R 445,399	R 1,772,750	R 410,174
\$ 30	R 709,380	R 435,498	R 1,418,130	R 534,478	R 2,127,300	R 492,209
\$ 40	R 945,840	R 580,664	R 1,890,840	R 712,638	R 2,836,400	R 656,279
\$ 50	R 1,182,300	R 725,830	R 2,363,550	R 890,797	R 3,545,500	R 820,349
\$ 75	R 1,773,450	R 1,088,744	R 3,545,325	R 1,336,196	R 5,318,250	R 1,230,523
\$ 100	R 2,364,600	R 1,451,659	R 4,727,100	R 1,781,594	R 7,091,000	R 1,640,697



Table 73: Carbon credit income revenues for the Terblanche property (expressed as R ha⁻¹ yr⁻¹ per collective title deeds and per restoration area) based on carbon accrual sensitivity analysis (with conversion factor for % spekboom cover and a conversion factor for degradation level, and *for all levels of degradation*.)

	Low C Accrual 10 years		Low C Accrual 20 years		Low C Accrual 30 years	
	Total Area	Spekboomveld	Total Area	Spekboomveld	Total Area	Spekboomveld
C price	1 474 ha's	271 ha's	1 474 ha's	271 ha's	1 474 ha's	271 ha's
\$ 5	R 5	R 27	R 3	R 16	R 2	R 10
\$ 10	R 10	R 54	R 6	R 33	R 4	R 20
\$ 15	R 15	R 80	R 9	R 49	R 6	R 30
\$ 20	R 20	R 107	R 12	R 66	R 7	R 40
\$ 25	R 25	R 134	R 15	R 82	R 9	R 50
\$ 30	R 30	R 161	R 18	R 99	R 11	R 61
\$ 40	R 39	R 214	R 24	R 131	R 15	R 81
\$ 50	R 49	R 268	R 30	R 164	R 19	R 101
\$ 75	R 74	R 402	R 45	R 247	R 28	R 151
\$ 100	R 98	R 536	R 60	R 329	R 37	R 202



6.3.20 United Congregational Church Property

Table 74. CO₂e accrual sensitivity matrix for the United Congregational Church property.

Carbon in t C ha ⁻¹ yr ⁻¹	Time in years		
	10	20	30
1	797	1596	2393
2	1596	3190	4785
4	3190	6380	9570

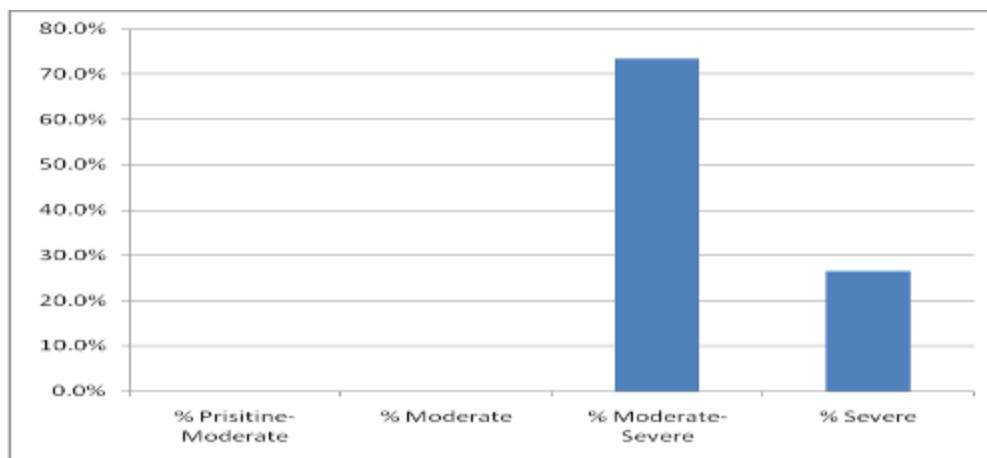


Figure 29. Relative percentages for spekboom-rich vegetation degradation classes for the United Congregational Church property.

Table 75. Predicted revenue for carbon credits for the United Congregational Church property.

C price	Low C Accrual		Discounted		Low C Accrual		Discounted	
	10 years	@ 5%	20 years	@ 5%	30 years	@ 5%	10 years	@ 5%
\$ 5	R 27,895	R 17,125	R 55,860	R 21,053	R 83,755	R 19,379		
\$ 10	R 55,790	R 34,250	R 111,720	R 42,106	R 167,510	R 38,758		
\$ 15	R 83,685	R 51,375	R 167,580	R 63,159	R 251,265	R 58,137		
\$ 20	R 111,580	R 68,500	R 223,440	R 84,212	R 335,020	R 77,516		
\$ 25	R 139,475	R 85,626	R 279,300	R 105,265	R 418,775	R 96,895		
\$ 30	R 167,370	R 102,751	R 335,160	R 126,318	R 502,530	R 116,274		
\$ 40	R 223,160	R 137,001	R 446,880	R 168,424	R 670,040	R 155,032		
\$ 50	R 278,950	R 171,251	R 558,600	R 210,530	R 837,550	R 193,790		
\$ 75	R 418,425	R 256,877	R 837,900	R 315,796	R 1,256,325	R 290,685		
\$ 100	R 557,900	R 342,502	R 1,117,200	R 421,061	R 1,675,100	R 387,580		



Table 76: Carbon credit income revenues for the United Congregational Church property (expressed as R ha⁻¹ yr⁻¹ per collective title deeds and per restoration area) based on carbon accrual sensitivity analysis (with conversion factor for % spekboom cover and a conversion factor for degradation level, and for all levels of degradation.)

	Low C Accrual 10 years		Low C Accrual 20 years		Low C Accrual 30 years	
	Total Area	Spekboomveld	Total Area	Spekboomveld	Total Area	Spekboomveld
C price	179 ha's	46 ha's	179 ha's	46 ha's	179 ha's	46 ha's
\$ 5	R 10	R 37	R 6	R 23	R 4	R 14
\$ 10	R 19	R 74	R 12	R 46	R 7	R 28
\$ 15	R 29	R 112	R 18	R 69	R 11	R 42
\$ 20	R 38	R 149	R 24	R 92	R 14	R 56
\$ 25	R 48	R 186	R 29	R 114	R 18	R 70
\$ 30	R 57	R 223	R 35	R 137	R 22	R 84
\$ 40	R 77	R 298	R 47	R 183	R 29	R 112
\$ 50	R 96	R 372	R 59	R 229	R 36	R 140
\$ 75	R 144	R 558	R 88	R 343	R 54	R 211
\$ 100	R 191	R 745	R 118	R 458	R 72	R 281

6.3.21 Van der Wat Property

Table 77. CO₂e accrual sensitivity matrix for the Van der Wat property.

Carbon in t C ha ⁻¹ yr ⁻¹	Time in years		
	10	20	30
1	4 926	9 854	14 780
2	9 854	19 708	29 562
4	19 708	39 417	59 122

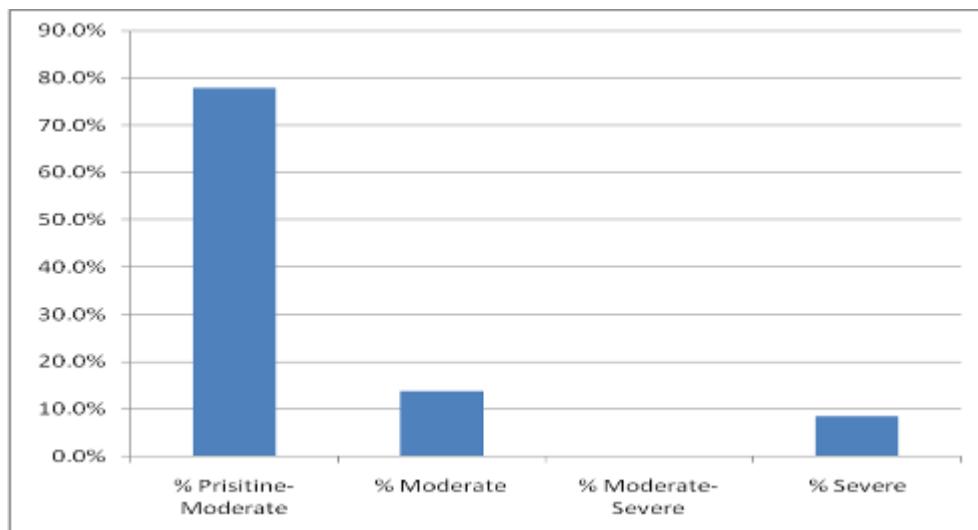


Figure 30. Relative percentages for spekboom-rich vegetation degradation classes for the van der Wat property.

Table 78. Predicted revenue for carbon credits for the Van der Wat property.

	Low C Accrual	Discounted	Low C Accrual	Discounted	Low C Accrual	Discounted
C price	10 years	@ 5%	20 years	@ 5%	30 years	@ 5%
\$ 5	R 172,410	R 105,845	R 344,890	R 129,985	R 517,300	R 119,692
\$ 10	R 344,820	R 211,690	R 689,780	R 259,971	R 1,034,600	R 239,383
\$ 15	R 517,230	R 317,534	R 1,034,670	R 389,956	R 1,551,900	R 359,075
\$ 20	R 689,640	R 423,379	R 1,379,560	R 519,942	R 2,069,200	R 478,766
\$ 25	R 862,050	R 529,224	R 1,724,450	R 649,927	R 2,586,500	R 598,458
\$ 30	R 1,034,460	R 635,069	R 2,069,340	R 779,912	R 3,103,800	R 718,149
\$ 40	R 1,379,280	R 846,758	R 2,759,120	R 1,039,883	R 4,138,400	R 957,532
\$ 50	R 1,724,100	R 1,058,448	R 3,448,900	R 1,299,854	R 5,173,000	R 1,196,916
\$ 75	R 2,586,150	R 1,587,672	R 5,173,350	R 1,949,781	R 7,759,500	R 1,795,373
\$ 100	R 3,448,200	R 2,116,896	R 6,897,800	R 2,599,708	R 10,346,000	R 2,393,831



Table 79: Carbon credit income revenues for the Van der Wat property (expressed as R ha⁻¹ yr⁻¹ per collective title deeds and per restoration area) based on carbon accrual sensitivity analysis (with conversion factor for % spekboom cover and a conversion factor for degradation level, and for all levels of degradation.)

	Low C Accrual 10 years		Low C Accrual 20 years		Low C Accrual 30 years	
	Total Area	Spekboomveld	Total Area	Spekboomveld	Total Area	Spekboomveld
C price	1023 ha's	322 ha's	1023 ha's	322 ha's	1023 ha's	322 ha's
\$ 5	R 10	R 33	R 6	R 20	R 4	R 12
\$ 10	R 21	R 66	R 13	R 40	R 8	R 25
\$ 15	R 31	R 99	R 19	R 61	R 12	R 37
\$ 20	R 41	R 131	R 25	R 81	R 16	R 50
\$ 25	R 52	R 164	R 32	R 101	R 20	R 62
\$ 30	R 62	R 197	R 38	R 121	R 23	R 74
\$ 40	R 83	R 263	R 51	R 161	R 31	R 99
\$ 50	R 103	R 329	R 64	R 202	R 39	R 124
\$ 75	R 155	R 493	R 95	R 303	R 59	R 186
\$ 100	R 207	R 657	R 127	R 404	R 78	R 248

6.3.22 Van Rensburg MG Property

Table 80. CO₂e accrual sensitivity matrix for the Van Rensburg MG property.

Carbon in t C ha ⁻¹ yr ⁻¹	Time in years		
	10	20	30
1	13 360	26 718	40 078
2	26 718	53 437	80 156
4	53 437	106 874	160 310

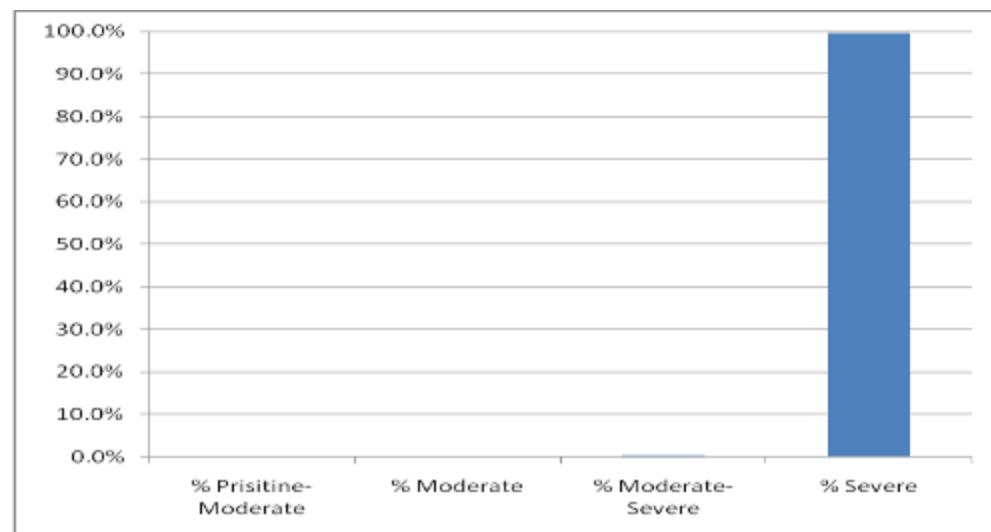


Figure 31. Relative percentages for spekboom-rich vegetation degradation classes for the van Rensburg MG property.

Table 81. Predicted revenue for carbon credits for the Van Rensburg MG property.

	Low C Accrual	Discounted	Low C Accrual	Discounted	Low C Accrual	Discounted
C price	10 years	@ 5%	20 years	@ 5%	30 years	@ 5%
\$ 5	R 467,600	R 287,066	R 935,130	R 352,441	R 1,402,730	R 324,560
\$ 10	R 935,200	R 574,132	R 1,870,260	R 704,881	R 2,805,460	R 649,120
\$ 15	R 1,402,800	R 861,198	R 2,805,390	R 1,057,322	R 4,208,190	R 973,680
\$ 20	R 1,870,400	R 1,148,263	R 3,740,520	R 1,409,763	R 5,610,920	R 1,298,240
\$ 25	R 2,338,000	R 1,435,329	R 4,675,650	R 1,762,203	R 7,013,650	R 1,622,800
\$ 30	R 2,805,600	R 1,722,395	R 5,610,780	R 2,114,644	R 8,416,380	R 1,947,361
\$ 40	R 3,740,800	R 2,296,527	R 7,481,040	R 2,819,525	R 11,221,840	R 2,596,481
\$ 50	R 4,676,000	R 2,870,658	R 9,351,300	R 3,524,407	R 14,027,300	R 3,245,601
\$ 75	R 7,014,000	R 4,305,988	R 14,026,950	R 5,286,610	R 21,040,950	R 4,868,401
\$ 100	R 9,352,000	R 5,741,317	R 18,702,600	R 7,048,813	R 28,054,600	R 6,491,202



Table 82: Carbon credit income revenues for the Van Rensburg MG property (expressed as R ha⁻¹ yr⁻¹ per collective title deeds and per restoration area) based on carbon accrual sensitivity analysis (with conversion factor for % spekboom cover and a conversion factor for degradation level, and for all levels of degradation.)

	Low C Accrual 10 years		Low C Accrual 20 years		Low C Accrual 30 years	
	Total Area	Spekboomveld	Total Area	Spekboomveld	Total Area	Spekboomveld
C price	801 ha's	542 ha's	801 ha's	542 ha's	801 ha's	542 ha's
\$ 5	R 36	R 64	R 22	R 39	R 14	R 24
\$ 10	R 72	R 127	R 44	R 78	R 27	R 48
\$ 15	R 108	R 191	R 66	R 117	R 41	R 72
\$ 20	R 143	R 254	R 88	R 156	R 54	R 96
\$ 25	R 179	R 318	R 110	R 195	R 68	R 120
\$ 30	R 215	R 381	R 132	R 234	R 81	R 144
\$ 40	R 287	R 508	R 176	R 312	R 108	R 191
\$ 50	R 358	R 635	R 220	R 390	R 135	R 239
\$ 75	R 538	R 953	R 330	R 585	R 203	R 359
\$ 100	R 717	R 1,270	R 440	R 780	R 270	R 479

6.3.23 Van Rensburg RJ Property

Table 83. CO₂e accrual sensitivity matrix for the Van Rensburg RJ property.

Carbon in t C ha ⁻¹ yr ⁻¹	Time in years		
	10	20	30
1	11 375	22 752	34 127
2	22 752	45 502	68 252
4	45 502	91 002	136 505

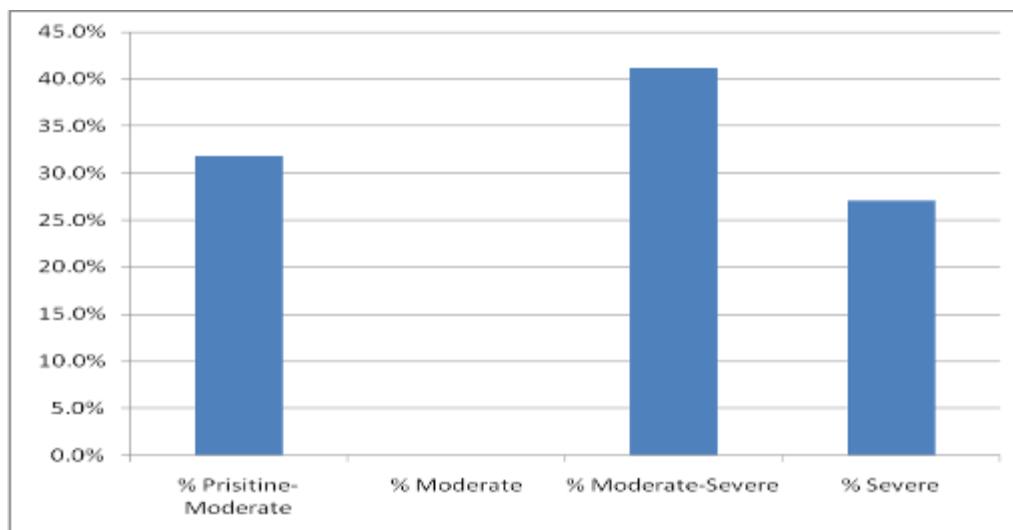


Figure 32. Relative percentages for spekboom-rich vegetation degradation classes for the Van Rensburg RJ property.

Table 84. Predicted revenue for carbon credits for the Van Rensburg RJ property.

	Low C Accrual	Discounted	Low C Accrual	Discounted	Low C Accrual	Discounted
C price	10 years	@ 5%	20 years	@ 5%	30 years	@ 5%
\$ 5	R 398,125	R 244,414	R 796,320	R 300,125	R 1,194,445	R 276,368
\$ 10	R 796,250	R 488,828	R 1,592,640	R 600,249	R 2,388,890	R 552,735
\$ 15	R 1,194,375	R 733,243	R 2,388,960	R 900,374	R 3,583,335	R 829,103
\$ 20	R 1,592,500	R 977,657	R 3,185,280	R 1,200,499	R 4,777,780	R 1,105,471
\$ 25	R 1,990,625	R 1,222,071	R 3,981,600	R 1,500,623	R 5,972,225	R 1,381,838
\$ 30	R 2,388,750	R 1,466,485	R 4,777,920	R 1,800,748	R 7,166,670	R 1,658,206
\$ 40	R 3,185,000	R 1,955,314	R 6,370,560	R 2,400,997	R 9,555,560	R 2,210,941
\$ 50	R 3,981,250	R 2,444,142	R 7,963,200	R 3,001,246	R 11,944,450	R 2,763,676
\$ 75	R 5,971,875	R 3,666,213	R 11,944,800	R 4,501,869	R 17,916,675	R 4,145,515
\$ 100	R 7,962,500	R 4,888,284	R 15,926,400	R 6,002,493	R 23,888,900	R 5,527,353



Table 85: Carbon credit income revenues for the Van Rensburg RJ property (expressed as R ha⁻¹ yr⁻¹ per collective title deeds and per restoration area) based on carbon accrual sensitivity analysis (with conversion factor for % spekboom cover and a conversion factor for degradation level, and for all levels of degradation.)

	Low C Accrual 10 years		Low C Accrual 20 years		Low C Accrual 30 years	
	Total Area	Spekboomveld	Total Area	Spekboomveld	Total Area	Spekboomveld
C price	5 155 ha's	1 061 ha's	5 155 ha's	1 061 ha's	5 155 ha's	1 061 ha's
\$ 5	R 5	R 23	R 3	R 14	R 2	R 9
\$ 10	R 9	R 46	R 6	R 28	R 4	R 17
\$ 15	R 14	R 69	R 9	R 42	R 5	R 26
\$ 20	R 19	R 92	R 12	R 57	R 7	R 35
\$ 25	R 24	R 115	R 15	R 71	R 9	R 43
\$ 30	R 28	R 138	R 17	R 85	R 11	R 52
\$ 40	R 38	R 184	R 23	R 113	R 14	R 69
\$ 50	R 47	R 230	R 29	R 141	R 18	R 87
\$ 75	R 71	R 346	R 44	R 212	R 27	R 130
\$ 100	R 95	R 461	R 58	R 283	R 36	R 174

6.3.24 Vorster Property

Table 86. CO₂e accrual sensitivity matrix for the Vorster property.

Carbon in t C ha ⁻¹ yr ⁻¹	Time in years		
	10	20	30
1	2 313	4 629	6 943
2	4 629	9 257	13 885
4	9 257	18 513	27 770

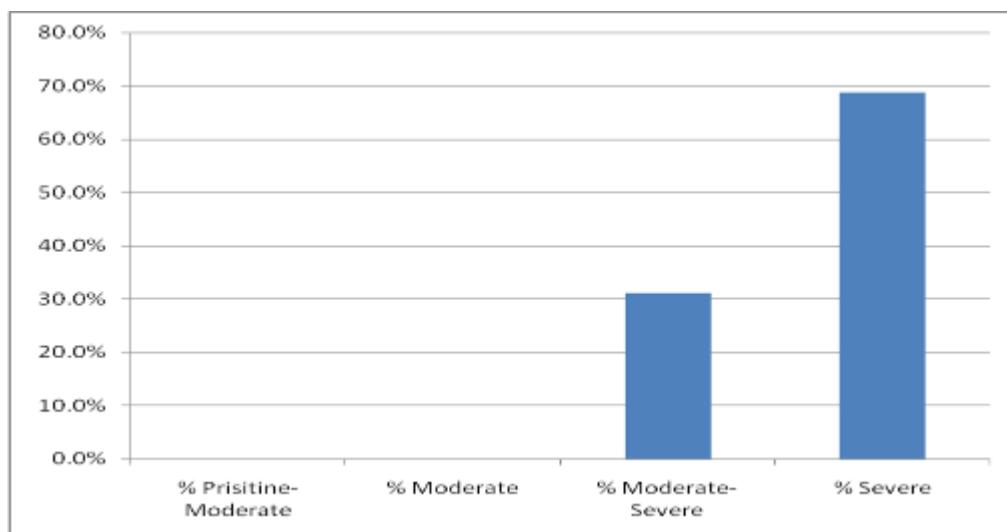


Figure 33. Relative percentages for spekboom-rich vegetation degradation classes for the Vorster property.

Table 87. Predicted revenue for carbon credits for the Vorster property.

	Low C Accrual	Discounted	Low C Accrual	Discounted	Low C Accrual	Discounted
C price	10 years	@ 5%	20 years	@ 5%	30 years	@ 5%
\$ 5	R 80,955	R 49,699	R 162,015	R 61,062	R 243,005	R 56,226
\$ 10	R 161,910	R 99,399	R 324,030	R 122,123	R 486,010	R 112,452
\$ 15	R 242,865	R 149,098	R 486,045	R 183,185	R 729,015	R 168,678
\$ 20	R 323,820	R 198,797	R 648,060	R 244,247	R 972,020	R 224,904
\$ 25	R 404,775	R 248,497	R 810,075	R 305,309	R 1,215,025	R 281,129
\$ 30	R 485,730	R 298,196	R 972,090	R 366,370	R 1,458,030	R 337,355
\$ 40	R 647,640	R 397,595	R 1,296,120	R 488,494	R 1,944,040	R 449,807
\$ 50	R 809,550	R 496,993	R 1,620,150	R 610,617	R 2,430,050	R 562,259
\$ 75	R 1,214,325	R 745,490	R 2,430,225	R 915,926	R 3,645,075	R 843,388
\$ 100	R 1,619,100	R 993,987	R 3,240,300	R 1,221,235	R 4,860,100	R 1,124,518



Table 88: Carbon credit income revenues for the Vorster property (expressed as R ha⁻¹ yr⁻¹ per collective title deeds and per restoration area) based on carbon accrual sensitivity analysis (with conversion factor for % spekboom cover and a conversion factor for degradation level, and *for all levels of degradation*.)

	Low C Accrual 10 years		Low C Accrual 20 years		Low C Accrual 30 years	
	Total Area	Spekboomveld	Total Area	Spekboomveld	Total Area	Spekboomveld
C price	689 ha's	192 ha's	689 ha's	192 ha's	689 ha's	192 ha's
\$ 5	R 7	R 26	R 4	R 16	R 3	R 10
\$ 10	R 14	R 52	R 9	R 32	R 5	R 20
\$ 15	R 22	R 78	R 13	R 48	R 8	R 29
\$ 20	R 29	R 104	R 18	R 64	R 11	R 39
\$ 25	R 36	R 129	R 22	R 80	R 14	R 49
\$ 30	R 43	R 155	R 27	R 95	R 16	R 59
\$ 40	R 58	R 207	R 35	R 127	R 22	R 78
\$ 50	R 72	R 259	R 44	R 159	R 27	R 98
\$ 75	R 108	R 388	R 66	R 239	R 41	R 146
\$ 100	R 144	R 518	R 89	R 318	R 54	R 195

6.3.25 Zandvlakte Boerdery Trust Property

Table 89. CO₂e accrual sensitivity matrix for the Zandvlakte property.

Carbon in t C ha ⁻¹ yr ⁻¹	Time in years		
	10	20	30
1	31 579	63 159	94 738
2	63 159	126 318	189 477
4	126 318	252 636	378 953

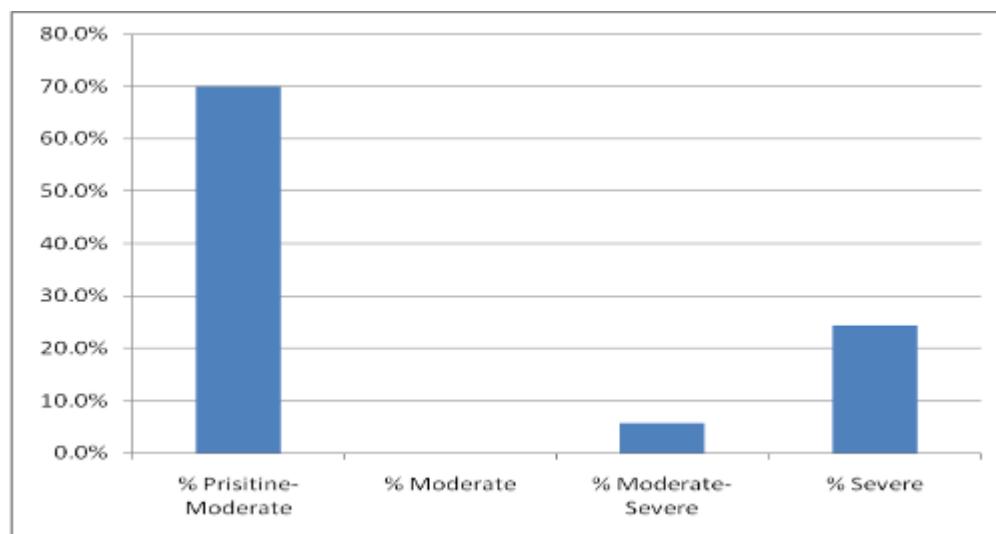


Figure 34. Relative percentages for spekboom-rich vegetation degradation classes for the Zandvlakte Boerdery Trust property.

Table 90. Predicted revenue for carbon credits for the Zandvlakte Boerdery Trust property.

	Low C Accrual	Discounted	Low C Accrual	Discounted	Low C Accrual	Discounted
C price	10 years	@ 5%	20 years	@ 5%	30 years	@ 5%
\$ 5	R 1,105,265	R 678,537	R 2,210,565	R 833,139	R 3,315,830	R 767,208
\$ 10	R 2,210,530	R 1,357,074	R 4,421,130	R 1,666,277	R 6,631,660	R 1,534,417
\$ 15	R 3,315,795	R 2,035,610	R 6,631,695	R 2,499,416	R 9,947,490	R 2,301,625
\$ 20	R 4,421,060	R 2,714,147	R 8,842,260	R 3,332,555	R 13,263,320	R 3,068,833
\$ 25	R 5,526,325	R 3,392,684	R 11,052,825	R 4,165,693	R 16,579,150	R 3,836,041
\$ 30	R 6,631,590	R 4,071,221	R 13,263,390	R 4,998,832	R 19,894,980	R 4,603,250
\$ 40	R 8,842,120	R 5,428,295	R 17,684,520	R 6,665,110	R 26,526,640	R 6,137,666
\$ 50	R 11,052,650	R 6,785,368	R 22,105,650	R 8,331,387	R 33,158,300	R 7,672,083
\$ 75	R 16,578,975	R 10,178,052	R 33,158,475	R 12,497,080	R 49,737,450	R 11,508,124
\$ 100	R 22,105,300	R 13,570,737	R 44,211,300	R 16,662,774	R 66,316,600	R 15,344,166



Table 91: Carbon credit income revenues for the Zandvlakte Boerdery Trust property (expressed as R ha⁻¹ yr⁻¹ per collective title deeds and per restoration area) based on carbon accrual sensitivity analysis (with conversion factor for % spekboom cover and a conversion factor for degradation level, and for all levels of degradation.)

	Low C Accrual 10 years		Low C Accrual 20 years		Low C Accrual 30 years	
	Total Area	Spekboomveld	Total Area	Spekboomveld	Total Area	Spekboomveld
C price	5 117 ha's	1 806 ha's	5 117 ha's	1 806 ha's	5 117 ha's	1 806 ha's
\$ 5	R 13	R 38	R 8	R 23	R 5	R 14
\$ 10	R 27	R 75	R 16	R 46	R 10	R 28
\$ 15	R 40	R 113	R 24	R 69	R 15	R 42
\$ 20	R 53	R 150	R 33	R 92	R 20	R 57
\$ 25	R 66	R 188	R 41	R 115	R 25	R 71
\$ 30	R 80	R 225	R 49	R 138	R 30	R 85
\$ 40	R 106	R 301	R 65	R 185	R 40	R 113
\$ 50	R 133	R 376	R 81	R 231	R 50	R 142
\$ 75	R 199	R 564	R 122	R 346	R 75	R 212
\$ 100	R 265	R 751	R 163	R 461	R 100	R 283

7. Conclusion

Given the fact that a vast amount of resources and energy has gone into researching, building the scientific, business and social cases for a PES programme ([Marais et al. 2010](#)) that hinges heavily on carbon credits in the Baviaanskloof, it is a relief to conclude that sufficient restoration opportunity exists to warrant further work. The work undertaken by the PRESENCE network, which includes Living Lands and the Working for Woodlands Programme should not be under-estimated. The establishment of carbon stock baselines in the adjacent area ([Powell 2009, Mills & Cowling 2010](#)), plus the near complete Project Design Document for VCS validation and later accreditation ([Mills et al. 2010](#)), also bodes well for a large-scale restoration programme. The field work ([Vlok 2010](#)), that provided the crucial basis for this report is not too dissimilar to



previous degradation mapping efforts and should give sufficient measure of confidence for the restoration implementation plans (either collectively or property by property).

We have been conservative with our estimations for carbon accrual rates and sensitive to the issues of biodiversity (specifically with regard to spekboom planting densities).

The restoration effort and hence the opportunity for carbon credits is not evenly balanced amongst the property owners (property sizes differ and levels of degradation differ). We advocate a very carefully packaged suite (bundled PES, stewardship etc.) of incentives that should be attractive to all landowners wishing to change land use to a more sustainable footing. We further advocate a cooperative model that seeks maximum inclusivity – especially the marginalised communities of Koleskeplaas, Zaaimanshoek and Sewefontein.

What will be required, is a very well thought through strategy that takes stock of all the potential benefits that key role players (EC Parks authority, Living Lands, GIB, Working-for-Woodlands, carbon investors, SANBI, etc) wishing to facilitate a land use change, can provide. Furthermore, some wizardry in the deal-making realm is paramount. The challenge will be to create this facility and opportunity in a relatively short period of time. The landowners need to have imminently implementable solutions now, and the investors have no appetite for bureaucracy. A real danger exists that a carbon-shark could enter into 1-on-1 negotiations with a select few individuals (that have large degraded properties with high earning potential). The loss of these landowners would seriously undermine the chances for carbon equity and a long-term sustainable solution. There is a need to cross-subsidise and provide positive incentives for those farmers who have intact subtropical thicket. The ECParks Authority has a real chance to become a major catalyst in this land use change – which provides a buffer for the ‘pristine’ wilderness area of the Baviaanskloof Nature Reserve. It should be a no-brainer that providing the ‘sweeteners’ (charismatic game, stewardship, collective branding and marketing and logistical support) would be a prudent investment for all role players.



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Appendix 1. Farm and Farm Owner Details.

Surveyor Code	Details 1	Details 2	Farm	Farm No	Subdivision Name	Subdivision No	Hectares
C08300000000021500002	BIDDULPH	PATRICIA JEAN	BEAKOS NEK	00000215	BEAKOS	00002	985.3
C08300000000020500003	CONGREGATIONAL CHURCH – WILLOWMORE		RIET RIVIER	00000205		00003	29.5
C08300000000021600006	CREATIVE FUTURES COMMUNITY TRUST		DE KLIP FONTEIN	00000216		00006	156.8
C08300000000021700000	CREATIVE FUTURES COMMUNITY TRUST		TCHNUGANOO	00000217		0000R	458.1
C08300000000020700001	DREAM WORLD INV 127 PTY LTD		ROCKSAND	00000207	VAAL KRANTS	00001	256.1
C08300000000020800000	DREAM WORLD INV 127 PTY LTD		KASEY	00000208		0000R	91.5
C08300000000020900000	DU PREEZ	ANDRE	VERLAATEN RIVIER	00000209		0000R	325.7
C08300000000020500002	DU PREEZ FAMILY TRUST		RIET RIVIER	00000205		00002	565.5
C08300000000020500004	DU PREEZ FAMILY TRUST		RIET RIVIER	00000205		00004	7.1
C08300000000021600005	EDUCATIONAL TRUSTEES		DE KLIP FONTEIN	00000216	KLIPFONTEIN SCHOOL	00005	0.4
C08300000000022400005	ERJEE TRUST		ZAND VLAKTE	00000224		00005	518.8
C08300000000021400000	HONEY	ROSA HERMINA	UITSLAG	00000214		0000R	442.0
C08300000000021400002	HONEY	ROSA HERMINA	UITSLAG	00000214	KOMWEER	00002	1117.1
C08300000000021400000	HONEY	ROSA HERMINA	UITSLAG	00000214		0000R	2.8
C08300000000021300000	HONEY	ROSA HERMINA	VLEY KLOOF	00000213		0000R	1423.1
C08300000000021600004	INITIATIVE S A INV 71 PTY LTD		DE KLIP FONTEIN	00000216	GRUIS BULT	00004	65.7
C08300000000021600004	INITIATIVE S A INV 71 PTY LTD		DE KLIP FONTEIN	00000216	GRUIS BULT	00004	274.5
C08300000000021600000	INITIATIVE S A INV 71 PTY LTD		DE KLIP FONTEIN	00000216		0000R	305.1
C08300000000021700002	INITIATIVE S A INV 71 PTY LTD		TCHNUGANOO	00000217	ANNEX KLIPFONTEIN	00002	549.8
C08300000000021700003	INITIATIVE S A INV 71 PTY LTD		TCHNUGANOO	00000217		00003	976.6
C08300000000021500000	LAMPRECHT – TRUSTEES	JOHAN SMITH	BEAKOS NEK	00000215		0000R	990.1
C08300000000021500001	LAMPRECHT – TRUSTEES	JOHAN SMITH	BEAKOS NEK	00000215	BEAKOS	00001	973.6
C08300000000021900007	LAMPRECHT – TRUSTEES	JOHAN SMITH	KLIP FONTEIN	00000219		00007	2.7
C08300000000021900005	LAMPRECHT – TRUSTEES	JOHAN SMITH	KLIP FONTEIN	00000219		00005	46.3
C08300000000021900008	LAMPRECHT – TRUSTEES	JOHAN SMITH	KLIP FONTEIN	00000219		00008	3.7
C08300000000022200000	LAMPRECHT – TRUSTEES	JOHAN SMITH	JOACHIMS KRAAL	00000222		0000R	787.4
C08300000000021900003	LAMPRECHT – TRUSTEES	JOHAN SMITH	KLIP FONTEIN	00000219		00003	208.8
C08300000000021900006	LAMPRECHT – TRUSTEES	JOHAN SMITH	KLIP FONTEIN	00000219		00006	7.4
C08300000000022000008	LAMPRECHT – TRUSTEES	JOHAN SMITH		00000220		00008	1305.9
C08300000000022300000	LAMPRECHT – TRUSTEES	JOHAN SMITH	JOACHIM'S KRAAL WEST	00000223		0000R	687.8
C08300000000022100001	LAMPRECHT – TRUSTEES	JOHAN SMITH	TCHANDO	00000221		00001	1306.9
C08300000000022100000	LAMPRECHT – TRUSTEES	JOHAN SMITH	TCHANDO	00000221		0000R	1306.4
C08300000000022100001	LAMPRECHT – TRUSTEES	JOHAN SMITH	TCHANDO	00000221		00001	238.7
C08300000000024300004	LAMPRECHT – TRUSTEES	JOHAN SMITH	KOUD NEKS RANTE	00000243		00004	775.3
C08300000000022000009	LAMPRECHT – TRUSTEES	JOHAN SMITH		00000220		00009	1245.8
C08300000000020600000	LEZMIN 2087 C C		MATJESFONTEIN	00000206		0000R	2603.6
C08300000000021900001	NED GER KERK – WILLOWMORE		KLIP FONTEIN	00000219		00001	0.8
C08300000000022200002	NED GER KERK – WILLOWMORE		JOACHIMS KRAAL	00000222		00002	0.5
C08300000000022400001	NED GER KERK – WILLOWMORE		ZAND VLAKTE	00000224	KERK PLAATS	00001	1.8
C08300000000024300000	NORTJE	RICHARD SCHELTEMA	KOUD NEKS RANTE	00000243		0000R	1267.2



C0830000000002440000	NORTJE	RICHARD SCHELTEMA	ANNEX KOUD NEKS RANTE	00000244		000R	364.3
C0830000000002460000	NORTJE	RICHARD SCHELTEMA	KOUD NEK	00000246		000R	1242.7
C0830000000002460002	NORTJE	RICHARD SCHELTEMA	KOUD NEK	00000246	MAKATEES KLOOF	0002	1221.9
C0830000000002240003	UNKNOWN		ZAND VLAKTE	00000224		0003	0.3
C0830000000002240002	UNKNOWN		ZAND VLAKTE	00000224		0002	0.7
C0830000000002160001	REYNEKE	ANDRE JOSIAS	DE KLIP FONTEIN	00000216		0001	500.3
C0830000000002240004	ROOIKLOOF C C		ZAND VLAKTE	00000224		0004	578.2
C0830000000002160007	SEWFONTEIN GEMEENSKAPSBOERDERY TRUST		DE KLIP FONTEIN	00000216		0007	367.3
C0830000000002160003	SEWFONTEIN GEMEENSKAPSBOERDERY TRUST		DE KLIP FONTEIN	00000216	SEWFONTEIN	0003	701.5
C0830000000002160008	SEWFONTEIN GEMEENSKAPSBOERDERY TRUST		DE KLIP FONTEIN	00000216		0008	40.6
C0830000000002170001	SEWFONTEIN GEMEENSKAPSBOERDERY TRUST		TCHNUGANOO	00000217	SEWFONTEIN	0001	300.8
C0830000000002050001	SMITH	NICO	RIET RIVIER	00000205		0001	547.6
C0830000000002180002	SMITH	DAVID LUCAS	KLEIN POORT	00000218	KLEINPOORT WEST	0002	269.2
C0830000000002180000	SMITH	DAVID LUCAS	KLEIN POORT	00000218		000R	290.7
C0830000000002180001	SMITH	DAVID LUCAS	KLEIN POORT	00000218		0001	557.3
C0830000000002430001	SMITH	DAVID LUCAS	GRASS NECK	00000243	KOMMANDOKLOOF	0001	1520.8
C0830000000002460001	SMITH	DAVID LUCAS	KOUD NEK	00000246	KARIEGA NEK	0001	1218.1
C0830000000002440001	SMITH	DAVID LUCAS	ANNEX KOUD NEKS RANTE	00000244		0001	71.6
C0830000000002050006	TERBLANCHE	IGNATIUS WILHELM	RIET RIVIER	00000205		0006	502.9
C0830000000002050000	TERBLANCHE	IGNATIUS WILHELM	RIET RIVIER	00000205		000R	971.0
C0830000000002160002	UNITED CONGREGATIONAL CHURCH OF SOUTH A		DE KLIP FONTEIN	00000216		0002	179.0
C0830000000002150003	VAN DER WAT	IZAK JOHANNES	BEAKOS NEK	00000215	BEAKOS	0003	1023.0
C0830000000002120000	VAN RENSBURG	RUBEN JANSE	VERLOREN RIVIER	00000212		000R	2512.4
C0830000000002140001	VAN RENSBURG	RUBEN JANSE	UITSLAG	00000214	VOORPOORT	0001	509.8
C0830000000002140003	VAN RENSBURG	RUBEN JANSE	UITSLAG	00000214	VLEIKLOOF	0003	2.4
C0830000000002140004	VAN RENSBURG	RUBEN JANSE	UITSLAG	00000214	VLEIKLOOF	0004	165.2
C0830000000002130002	VAN RENSBURG	RUBEN JANSE	VLEY KLOOF	00000213	FONTEINS KLOOF	0002	1100.9
C0830000000002130003	VAN RENSBURG	RUBEN JANSE	VLEY KLOOF	00000213	NOUPOORT	0003	442.4
C0830000000002190000	VAN RENSBURG	MARNE GERTRUDE JANSE	KLIP FONTEIN	00000219		000R	242.6
C0830000000002190012	VAN RENSBURG	MARNE GERTRUDE JANSE	KLIP FONTEIN	00000219		00012	3.3
C0830000000002190009	VAN RENSBURG	MARNE GERTRUDE JANSE	KLIP FONTEIN	00000219		00009	4.9
C0830000000002190013	VAN RENSBURG	MARNE GERTRUDE JANSE	KLIP FONTEIN	00000219		00013	0.6
C0830000000002190010	VAN RENSBURG	MARNE GERTRUDE JANSE	KLIP FONTEIN	00000219		00010	3.2
C0830000000002190004	VAN RENSBURG	MARNE GERTRUDE JANSE	KLIP FONTEIN	00000219		00004	275.1
C0830000000002190000	VAN RENSBURG	MARNE GERTRUDE JANSE	KLIP FONTEIN	00000219		000R	3.0
C0830000000002190000	VAN RENSBURG	MARNE GERTRUDE JANSE	KLIP FONTEIN	00000219		000R	0.4
C0830000000002190011	VAN RENSBURG	MARNE GERTRUDE JANSE	KLIP FONTEIN	00000219		00011	1.4
C0830000000002190002	VAN RENSBURG	MARNE GERTRUDE JANSE	KLIP FONTEIN	00000219		00002	256.8
C0830000000002130001	VAN RENSBURG	RUBEN JANSE	VLEY KLOOF	00000213	ANNEX UITSLAG	0001	161.3
C0830000000002190000	VAN RENSBURG	MARNE GERTRUDE JANSE	KLIP FONTEIN	00000219		000R	7.3
C0830000000002190000	VAN RENSBURG	MARNE GERTRUDE JANSE	KLIP FONTEIN	00000219		000R	2.0
C0830000000002130004	VAN RENSBURG	RUBEN JANSE	VLEY KLOOF	00000213	ANNEX NOUPOORT	0004	260.6
C0830000000002070002	VORSTER	JOHAN WILHELM	ROCKSAND	00000207		0002	66.1



C08300000000020800002	VORSTER	JOHAN WILHELM	KASEY	00000208		00002	112.8
C08300000000020900001	VORSTER	JOHAN WILHELM	VERLAATEN RIVIER	00000209	GROOT PLAAT	00001	509.9
C08300000000024200000	ZANDVLAKTE BOERDERY TRUST		SAND RIVER	00000242		0000R	2263.1
C08300000000024300002	ZANDVLAKTE BOERDERY TRUST		KOUD NEKS RANTE	00000243	ZONGHA	00002	1314.3
C08300000000022400000	ZANDVLAKTE BOERDERY TRUST		ZAND VLAKTE	00000224		0000R	1539.6

**Appendix 2. Restoration Polygon Details**

REC NO	OWNER	HA'S	LONGITUDE	LATITUDE	DMS LONGITUDE	DMS LATITUDE
1	VAN RENSBURG RJ	79.9	23.86930273	-33.53467511	23 52 9.4898	-33 32 4.830
2	VAN RENSBURG RJ	34.0	23.87193024	-33.51290216	23 52 18.948	-33 30 46.44
3	VAN RENSBURG RJ	29.9	23.86336941	-33.53983983	23 51 48.129	-33 32 23.42
4	VAN RENSBURG RJ	36.8	23.85543204	-33.54018282	23 51 19.555	-33 32 24.65
5	VAN RENSBURG RJ	279.2	23.85577914	-33.52954449	23 51 20.804	-33 31 46.36
6	VAN RENSBURG RJ	123.6	23.83105741	-33.51606678	23 49 51.806	-33 30 57.84
7	VORSTER	7.4	23.78680321	-33.50498032	23 47 12.491	-33 30 17.92
8	DREAM WORLD INV 127 PTY LTD	44.8	23.76106639	-33.50842089	23 45 39.839	-33 30 30.31
9	HONEY	73.2	23.88757098	-33.51278949	23 53 15.255	-33 30 46.04
10	HONEY	92.6	23.90384604	-33.53472724	23 54 13.845	-33 32 5.018
11	HONEY	79.2	23.91264814	-33.52599587	23 54 45.533	-33 31 33.58
12	HONEY	52.9	23.90612902	-33.51515350	23 54 22.064	-33 30 54.55
13	HONEY	10.5	23.88626847	-33.55713840	23 53 10.566	-33 33 25.69
14	DU PREEZ FAMILY TRUST	10.7	23.69845825	-33.52400434	23 41 54.449	-33 31 26.41
15	DU PREEZ FAMILY TRUST	26.8	23.73837583	-33.51526737	23 44 18.153	-33 30 54.96
16	DU PREEZ FAMILY TRUST	29.3	23.72161961	-33.51538445	23 43 17.830	-33 30 55.38
17	DU PREEZ FAMILY TRUST	45.2	23.68991100	-33.53384809	23 41 23.679	-33 32 1.853
18	VORSTER	52.4	23.78822767	-33.51079558	23 47 17.619	-33 30 38.86
19	VORSTER	0.3	23.78133502	-33.51099269	23 46 52.806	-33 30 39.57
20	DU PREEZ	1.1	23.74619996	-33.51928600	23 44 46.319	-33 31 9.429
21	DU PREEZ	27.9	23.75097324	-33.52266728	23 45 3.5036	-33 31 21.60
22	DU PREEZ	57.8	23.75603918	-33.51451923	23 45 21.741	-33 30 52.26
23	DREAM WORLD INV 127 PTY LTD	0.4	23.77991991	-33.51388261	23 46 47.711	-33 30 49.97
24	DREAM WORLD INV 127 PTY LTD	37.0	23.77293456	-33.51225706	23 46 22.564	-33 30 44.12
25	SMITH N	20.5	23.69476595	-33.52458543	23 41 41.157	-33 31 28.50
26	SMITH N	13.4	23.70907133	-33.51701326	23 42 32.656	-33 31 1.247
27	SMITH N	4.4	23.68684078	-33.53373776	23 41 12.626	-33 32 1.455
28	SMITH N	25.9	23.68269958	-33.53183953	23 40 57.718	-33 31 54.62
29	SMITH N	22.9	23.68518533	-33.52477146	23 41 6.6671	-33 31 29.17
30	LAMPRECHT - TRUSTEES	0.7	23.93422227	-33.51739010	23 56 3.2001	-33 31 2.604
31	LAMPRECHT - TRUSTEES	3.5	23.91291118	-33.53526119	23 54 46.480	-33 32 6.940
32	LAMPRECHT - TRUSTEES	23.8	23.91931424	-33.53252304	23 55 9.5312	-33 31 57.08
33	LAMPRECHT - TRUSTEES	37.3	23.92005733	-33.52654330	23 55 12.206	-33 31 35.55
34	LAMPRECHT - TRUSTEES	26.9	23.92697670	-33.51741024	23 55 37.116	-33 31 2.676
35	LAMPRECHT - TRUSTEES	68.4	23.93433884	-33.52389854	23 56 3.6198	-33 31 26.03
36	LAMPRECHT - TRUSTEES	32.3	23.92851270	-33.53227844	23 55 42.645	-33 31 56.20
37	LAMPRECHT - TRUSTEES	1.3	23.92621021	-33.52746281	23 55 34.356	-33 31 38.86
38	CONGREGATIONAL CHURCH - WILLOWMORE	16.5	23.71402727	-33.51655202	23 42 50.498	-33 30 59.58
39	VORSTER	128.4	23.76155425	-33.52478310	23 45 41.595	-33 31 29.21
40	VORSTER	3.3	23.76235828	-33.51958172	23 45 44.489	-33 31 10.49
41	BIDDULPH	17.4	23.94221191	-33.52320663	23 56 31.962	-33 31 23.54
42	BIDDULPH	43.2	23.94704062	-33.52889414	23 56 49.346	-33 31 44.01
43	BIDDULPH	120.2	23.93331497	-33.55538909	23 55 59.933	-33 33 19.40
44	TERBLANCHE	67.3	23.71091523	-33.52871890	23 42 39.294	-33 31 43.38
45	TERBLANCHE	5.5	23.72199041	-33.51686215	23 43 19.165	-33 31 0.703
46	TERBLANCHE	4.4	23.69661644	-33.53495449	23 41 47.819	-33 32 5.836
47	TERBLANCHE	69.5	23.71972431	-33.52879680	23 43 11.007	-33 31 43.66
48	TERBLANCHE	5.8	23.74509166	-33.51922842	23 44 42.33	-33 31 9.222
49	TERBLANCHE	48.7	23.73862826	-33.52450885	23 44 19.061	-33 31 28.23
50	TERBLANCHE	69.6	23.73041632	-33.53402910	23 43 49.498	-33 32 2.504
51	VAN DER WAT	27.3	23.94817871	-33.56252769	23 56 53.443	-33 33 45.09
52	VAN DER WAT	0.7	23.94894361	-33.54771440	23 56 56.197	-33 32 51.77
53	VAN DER WAT	43.4	23.95300288	-33.53416729	23 57 10.810	-33 32 3.002
54	VAN DER WAT	250.3	23.94501436	-33.55128010	23 56 42.051	-33 33 4.608
55	REYNEKE	48.4	23.96646481	-33.53405321	23 57 59.273	-33 32 2.591
56	REYNEKE	81.2	23.98574885	-33.53619759	23 59 8.6958	-33 32 10.31



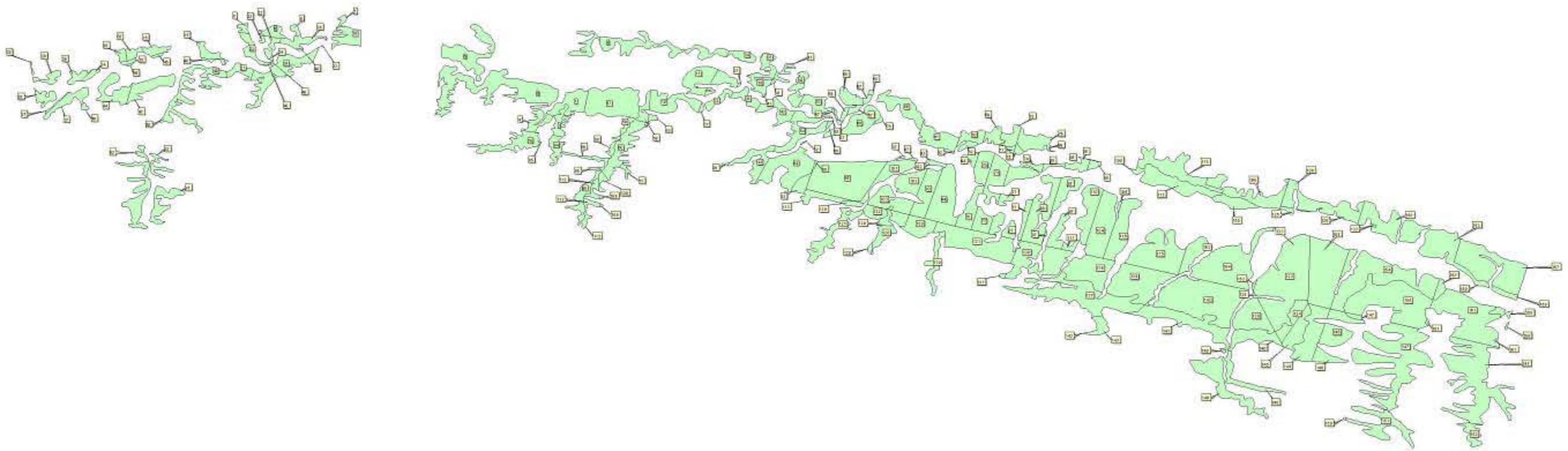
57	VAN RENSBURG RJ	181.0	23.88158203	-33.53373699	23 52 53.695	-33 32 1.453
58	VAN RENSBURG RJ	35.3	23.88206531	-33.54813230	23 52 55.435	-33 32 53.27
59	VAN RENSBURG RJ	25.8	23.89253090	-33.53483789	23 53 33.111	-33 32 5.416
60	VAN RENSBURG RJ	91.6	23.88623703	-33.55002907	23 53 10.453	-33 33 0.104
61	SEWFONTEIN GEMEENSKAPSBOERDERY TRUST	82.1	23.99670804	-33.54509253	23 59 48.148	-33 32 42.33
62	UNITED CONGREGATIONAL CHURCH OF S A	11.8	24.00660699	-33.54891973	24 00.00 23.	-33 32 56.11
63	UNITED CONGREGATIONAL CHURCH OF S A	33.7	24.00775642	-33.54628276	24 00.00 27.	-33 32 46.61
64	UNITED CONGREGATIONAL CHURCH OF S A	0.4	24.01036079	-33.55119067	24 00.00 37.	-33 33 4.286
65	SEWFONTEIN GEMEENSKAPSBOERDERY TRUST	286.8	23.96414593	-33.56114760	23 57 50.925	-33 33 40.13
66	SEWFONTEIN GEMEENSKAPSBOERDERY TRUST	92.9	23.96594421	-33.54010232	23 57 57.399	-33 32 24.36
67	SEWFONTEIN GEMEENSKAPSBOERDERY TRUST	20.9	23.96591881	-33.53606553	23 57 57.307	-33 32 9.835
68	SEWFONTEIN GEMEENSKAPSBOERDERY TRUST	6.2	23.95290551	-33.55598908	23 57 10.459	-33 33 21.56
69	SMITH D	29.5	24.01581208	-33.54514787	24 00.00 56.	-33 32 42.53
70	SMITH D	123.0	24.00916211	-33.56430715	24 00.00 32.	-33 33 51.50
71	SMITH D	5.3	24.02175268	-33.54981707	24 1 18.3096	-33 32 59.34
72	SMITH D	32.9	24.02162279	-33.54518412	24 1 17.842	-33 32 42.66
73	SMITH D	125.8	24.01451212	-33.56547332	24 00.00 52.	-33 33 55.70
74	SMITH D	12.6	24.02910435	-33.55602180	24 1 44.7757	-33 33 21.67
75	SMITH D	8.6	24.02455980	-33.54970322	24 1 28.4153	-33 32 58.93
76	SMITH D	59.5	24.02981187	-33.54646862	24 1 47.3227	-33 32 47.28
77	SMITH D	135.0	24.02537376	-33.55905149	24 1 31.3455	-33 33 32.58
78	SEWFONTEIN GEMEENSKAPSBOERDERY TRUST	3.7	23.97520154	-33.53981958	23 58 30.725	-33 32 23.35
79	HONEY	79.3	23.85120366	-33.54742522	23 51 4.3331	-33 32 50.73
80	EDUCATIONAL TRUSTEES	0.4	23.97399655	-33.54022143	23 58 26.387	-33 32 24.79
81	LEZMIN 2087 C C	58.8	23.72182915	-33.56955063	23 43 18.584	-33 34 10.38
82	LEZMIN 2087 C C	105.7	23.71720568	-33.56326849	23 43 1.9404	-33 33 47.76
83	LEZMIN 2087 C C	21.8	23.72022871	-33.55569628	23 43 12.823	-33 33 20.50
84	VAN RENSBURG RJ	33.5	23.86202602	-33.55036784	23 51 43.293	-33 33 1.324
85	VAN RENSBURG RJ	0.6	23.85604108	-33.54822920	23 51 21.747	-33 32 53.62
86	VAN RENSBURG RJ	58.4	23.87166938	-33.56612021	23 52 18.009	-33 33 58.03
87	INITIATIVE S A INV 71 PTY LTD	3.4	23.98715676	-33.55354702	23 59 13.764	-33 33 12.76
88	VAN RENSBURG MG	8.5	24.03387239	-33.55632358	24 2 1.9406	-33 33 22.76
89	VAN RENSBURG MG	1.2	24.03534082	-33.54979077	24 2 7.22695	-33 32 59.24
90	VAN RENSBURG MG	144.5	24.03233405	-33.57126413	24 1 56.4026	-33 34 16.55
91	CREATIVE FUTURES COMMUNITY TRUST	0.0	24.00356178	-33.55076954	24 00.00 12.	-33 33 2.770
92	CREATIVE FUTURES COMMUNITY TRUST	0.9	24.00115191	-33.55108539	24 00.00 4.1	-33 33 3.907
93	CREATIVE FUTURES COMMUNITY TRUST	102.8	23.99259717	-33.56394915	23 59 33.349	-33 33 50.21
94	INITIATIVE S A INV 71 PTY LTD	173.4	24.00092244	-33.56408665	24 00.00 3.3	-33 33 50.71
95	VAN RENSBURG MG	25.0	24.04511487	-33.55530337	24 2 42.4135	-33 33 19.09
96	VAN RENSBURG MG	0.2	24.04911858	-33.55355751	24 2 56.8269	-33 33 12.80
97	VAN RENSBURG MG	105.8	24.04112306	-33.56704168	24 2 28.043	-33 34 1.350
98	VAN RENSBURG MG	0.0	24.04561461	-33.55273571	24 2 44.2126	-33 33 9.848
99	LAMPRECHT - TRUSTEES	10.9	24.05103336	-33.55555261	24 3 3.7201	-33 33 19.98
100	LAMPRECHT - TRUSTEES	0.3	24.05128184	-33.55398750	24 3 4.61462	-33 33 14.35
101	INITIATIVE S A INV 71 PTY LTD	75.4	23.97572359	-33.56087158	23 58 32.604	-33 33 39.13
102	INITIATIVE S A INV 71 PTY LTD	2.0	23.97926749	-33.57065704	23 58 45.363	-33 34 14.36
103	INITIATIVE S A INV 71 PTY LTD	152.7	23.97533044	-33.56771263	23 58 31.189	-33 34 3.765
104	VAN RENSBURG MG	166.4	24.05422842	-33.57618640	24 3 15.2223	-33 34 34.27
105	VAN RENSBURG MG	0.5	24.06413359	-33.55713979	24 3 50.8809	-33 33 25.70
106	LAMPRECHT - TRUSTEES	259.0	24.13335229	-33.59322250	24 8 0.06824	-33 35 35.60
107	LAMPRECHT - TRUSTEES	0.0	24.12617910	-33.60414526	24 7 34.2448	-33 36 14.92
108	LAMPRECHT - TRUSTEES	142.1	24.12605815	-33.56826051	24 7 33.8093	-33 34 5.737
109	VAN RENSBURG RJ	15.0	23.87752483	-33.56122499	23 52 39.089	-33 33 40.41
110	LAMPRECHT - TRUSTEES	98.7	24.04943560	-33.57379644	24 2 57.9682	-33 34 25.66
111	LAMPRECHT - TRUSTEES	12.6	24.04088015	-33.58388321	24 2 27.1685	-33 35 1.979
112	VAN RENSBURG RJ	36.2	23.87348188	-33.56895291	23 52 24.534	-33 34 8.230
113	SEWFONTEIN GEMEENSKAPSBOERDERY TRUST	36.4	23.95712420	-33.56676794	23 57 25.647	-33 34 0.364
114	SEWFONTEIN GEMEENSKAPSBOERDERY TRUST	0.3	23.95522298	-33.57755464	23 57 18.802	-33 34 39.19
115	LAMPRECHT - TRUSTEES	208.8	24.07265165	-33.58596914	24 4 21.5459	-33 35 9.488



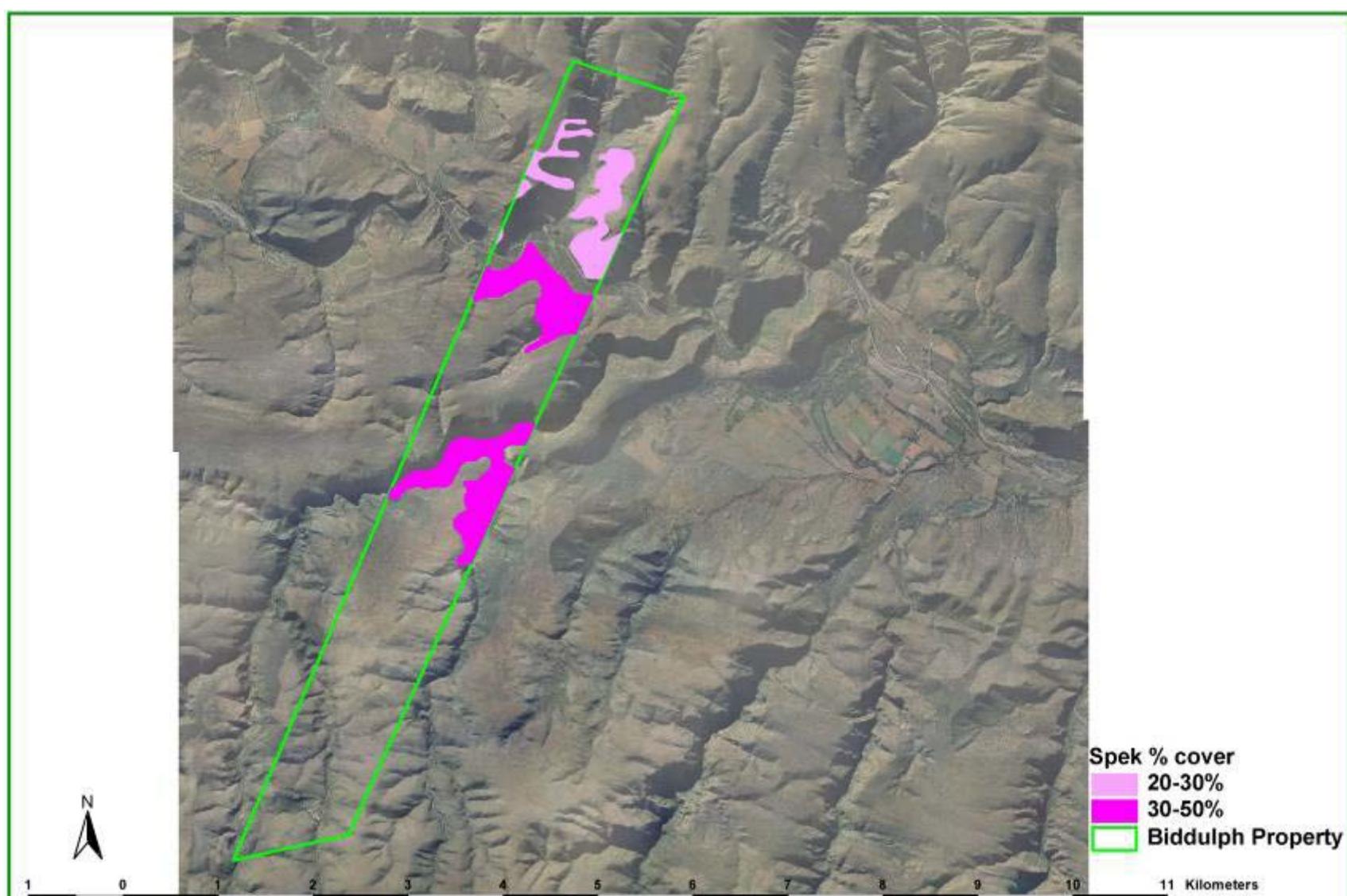
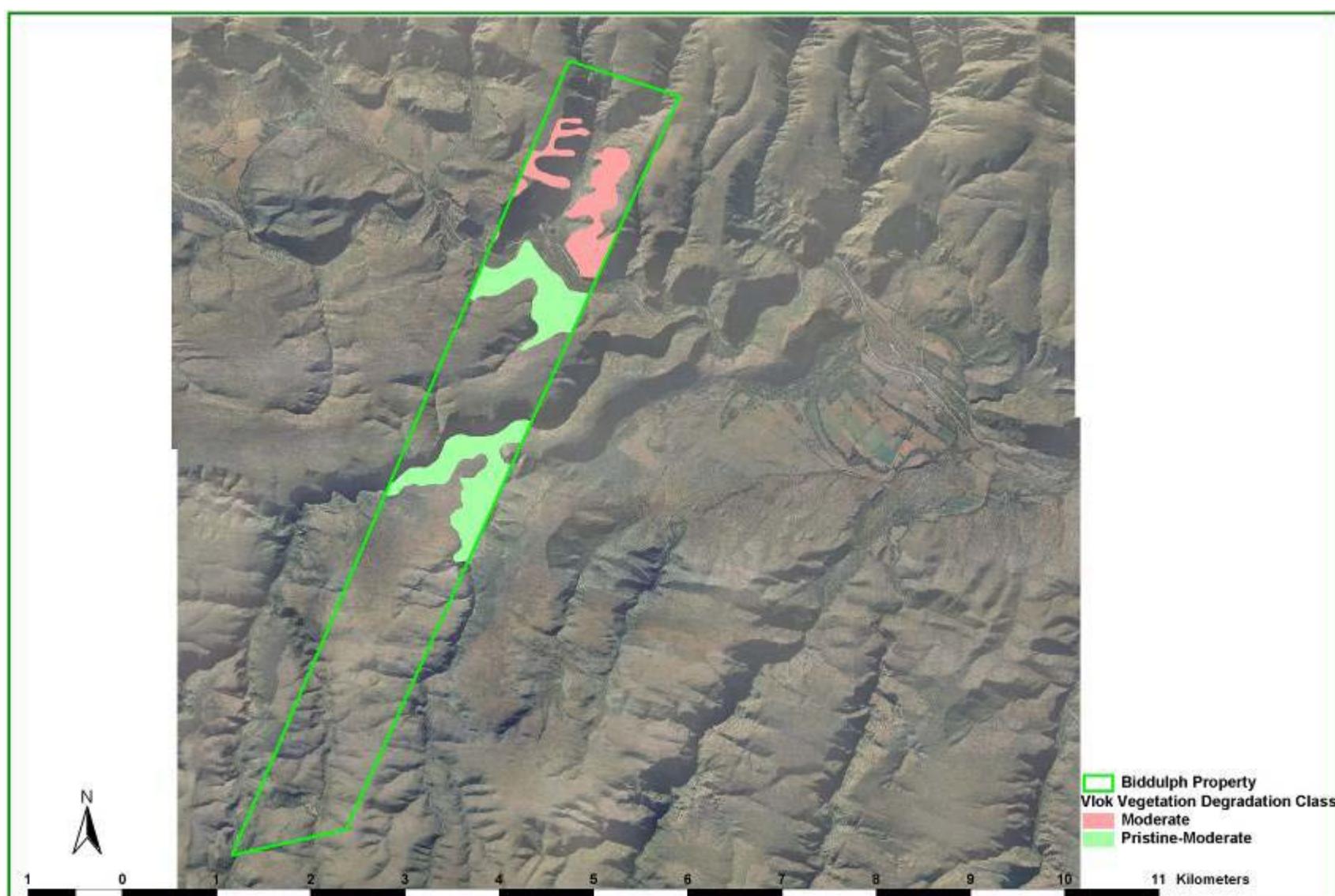
116	LAMPRECHT - TRUSTEES	119.3	24.06093503	-33.57817989	24 3 39.3661	-33 34 41.44
117	LAMPRECHT - TRUSTEES	123.7	24.08014925	-33.56108634	24 4 48.5373	-33 33 39.91
118	LAMPRECHT - TRUSTEES	130.8	24.08115054	-33.55722522	24 4 52.1419	-33 33 26.01
119	INITIATIVE S A INV 71 PTY LTD	12.5	23.96606101	-33.56902945	23 57 57.819	-33 34 8.506
120	INITIATIVE S A INV 71 PTY LTD	19.9	23.97754383	-33.57390778	23 58 39.157	-33 34 26.06
121	INITIATIVE S A INV 71 PTY LTD	88.2	23.95808200	-33.58013773	23 57 29.095	-33 34 48.49
122	INITIATIVE S A INV 71 PTY LTD	57.7	23.97791773	-33.57316016	23 58 40.503	-33 34 23.37
123	LAMPRECHT - TRUSTEES	403.1	24.11688415	-33.59685158	24 7 0.78294	-33 35 48.66
124	LAMPRECHT - TRUSTEES	55.4	24.12032447	-33.61060941	24 7 13.1681	-33 36 38.19
125	LAMPRECHT - TRUSTEES	0.7	24.11413882	-33.57794525	24 6 50.8998	-33 34 40.60
126	LAMPRECHT - TRUSTEES	9.8	24.11862654	-33.57137568	24 7 7.05554	-33 34 16.95
127	NED GER KERK - WILLOWMORE	0.5	24.13054924	-33.57076775	24 7 49.9773	-33 34 14.76
128	CREATIVE FUTURES COMMUNITY TRUST	34.7	23.97713346	-33.58165310	23 58 37.680	-33 34 53.95
129	CREATIVE FUTURES COMMUNITY TRUST	64.7	23.98922172	-33.57692287	23 59 21.198	-33 34 36.92
130	INITIATIVE S A INV 71 PTY LTD	44.4	23.99497319	-33.59000365	23 59 41.903	-33 35 24.01
131	INITIATIVE S A INV 71 PTY LTD	213.9	24.00968330	-33.58532588	24 00.00 34.	-33 35 7.173
132	NED GER KERK - WILLOWMORE	1.7	24.14907866	-33.57671638	24 8 56.6832	-33 34 36.17
133	NOT IN DEEDSWEB	0.3	24.16523626	-33.57972872	24 9 54.8505	-33 34 47.02
134	LAMPRECHT - TRUSTEES	205.2	24.06791301	-33.59729586	24 4 4.48684	-33 35 50.26
135	LAMPRECHT - TRUSTEES	0.6	24.07519945	-33.59876636	24 4 30.718	-33 35 55.55
136	LAMPRECHT - TRUSTEES	144.3	24.04904584	-33.59359713	24 2 56.565	-33 35 36.94
137	LAMPRECHT - TRUSTEES	259.0	24.04381049	-33.60065746	24 2 37.7178	-33 36 2.366
138	LAMPRECHT - TRUSTEES	177.6	24.03711935	-33.58938682	24 2 13.6297	-33 35 21.79
139	LAMPRECHT - TRUSTEES	112.9	24.10704861	-33.60723685	24 6 25.375	-33 36 26.05
140	LAMPRECHT - TRUSTEES	73.6	24.10765041	-33.61686977	24 6 27.5415	-33 37 0.731
141	LAMPRECHT - TRUSTEES	2.4	24.07054364	-33.60320872	24 4 13.9571	-33 36 11.55
142	LAMPRECHT - TRUSTEES	355.9	24.08844084	-33.60355273	24 5 18.387	-33 36 12.78
143	LAMPRECHT - TRUSTEES	180.1	24.09023489	-33.61251269	24 5 24.8456	-33 36 45.04
144	LAMPRECHT - TRUSTEES	126.2	24.12686861	-33.61438784	24 7 36.727	-33 36 51.79
145	LAMPRECHT - TRUSTEES	67.4	24.12203329	-33.61264412	24 7 19.3198	-33 36 45.51
146	ZANDVLAKTE BOERDERY TRUST	134.9	24.13673847	-33.61544917	24 8 12.2585	-33 36 55.61
147	ZANDVLAKTE BOERDERY TRUST	715.1	24.18237915	-33.62630961	24 10 56.564	-33 37 34.71
148	LAMPRECHT - TRUSTEES	49.7	24.09845748	-33.62830182	24 5 54.4469	-33 37 41.88
149	LAMPRECHT - TRUSTEES	129.9	24.09551532	-33.63361370	24 5 43.8552	-33 38 1.009
150	SMITH D	0.5	24.13899913	-33.64469878	24 8 20.3969	-33 38 40.91
151	NORTJE	104.1	24.15139932	-33.64750655	24 9 5.03755	-33 38 51.02
152	ZANDVLAKTE BOERDERY TRUST	35.3	24.18283654	-33.65018199	24 10 58.211	-33 39 0.655
153	ZANDVLAKTE BOERDERY TRUST	198.2	24.17378426	-33.58674418	24 10 25.623	-33 35 12.27
154	ZANDVLAKTE BOERDERY TRUST	305.3	24.15314566	-33.59616521	24 9 11.3244	-33 35 46.19
155	ZANDVLAKTE BOERDERY TRUST	313.2	24.15433538	-33.60339743	24 9 15.6074	-33 36 12.23
156	ZANDVLAKTE BOERDERY TRUST	103.6	24.15105825	-33.57567395	24 9 3.8097	-33 34 32.42
157	ERJEE TRUST	251.5	24.19024933	-33.59127082	24 11 24.897	-33 35 28.57
158	ROOIKLOOF C C	16.2	24.19379125	-33.60735352	24 11 37.648	-33 36 26.47
159	ROOIKLOOF C C	16.8	24.19220180	-33.60012616	24 11 31.926	-33 36 0.454
160	ROOIKLOOF C C	17.6	24.17242992	-33.59916440	24 10 20.747	-33 35 56.99
161	ROOIKLOOF C C	263.2	24.18048463	-33.60931268	24 10 49.744	-33 36 33.52
162	LAMPRECHT - TRUSTEES	3.1	24.10730168	-33.59773828	24 6 26.286	-33 35 51.85
163	LAMPRECHT - TRUSTEES	62.0	24.08578015	-33.58739785	24 5 8.80854	-33 35 14.63
164	LAMPRECHT - TRUSTEES	260.2	24.09803771	-33.58836790	24 5 52.9358	-33 35 18.12
165	LAMPRECHT - TRUSTEES	47.6	24.10062311	-33.56820986	24 6 2.2432	-33 34 5.555
166	LAMPRECHT - TRUSTEES	110.2	24.09857659	-33.56475499	24 5 54.8757	-33 33 53.11



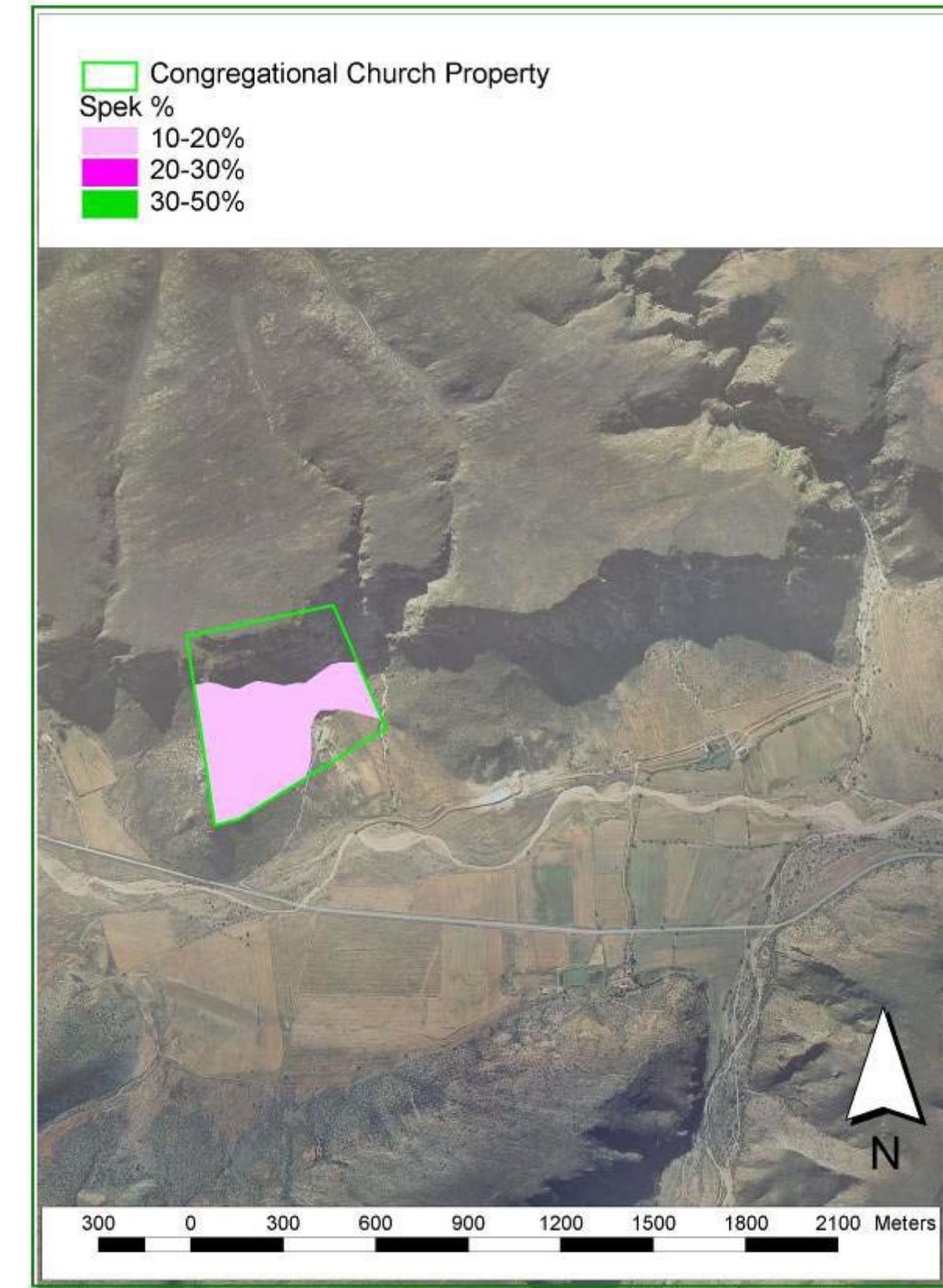
Appendix 3. Spekboom vegetation polygons (Vlok 2010)



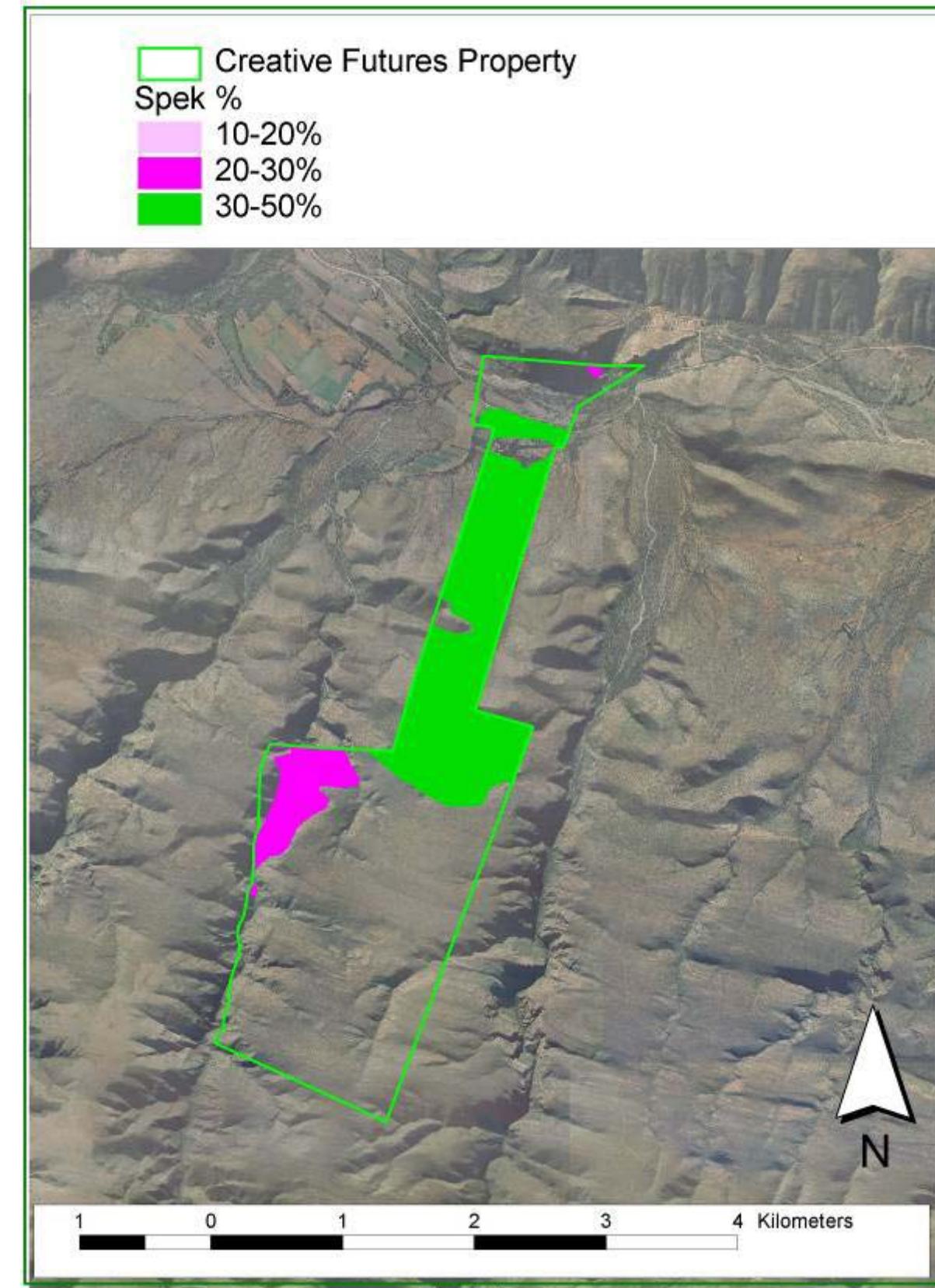
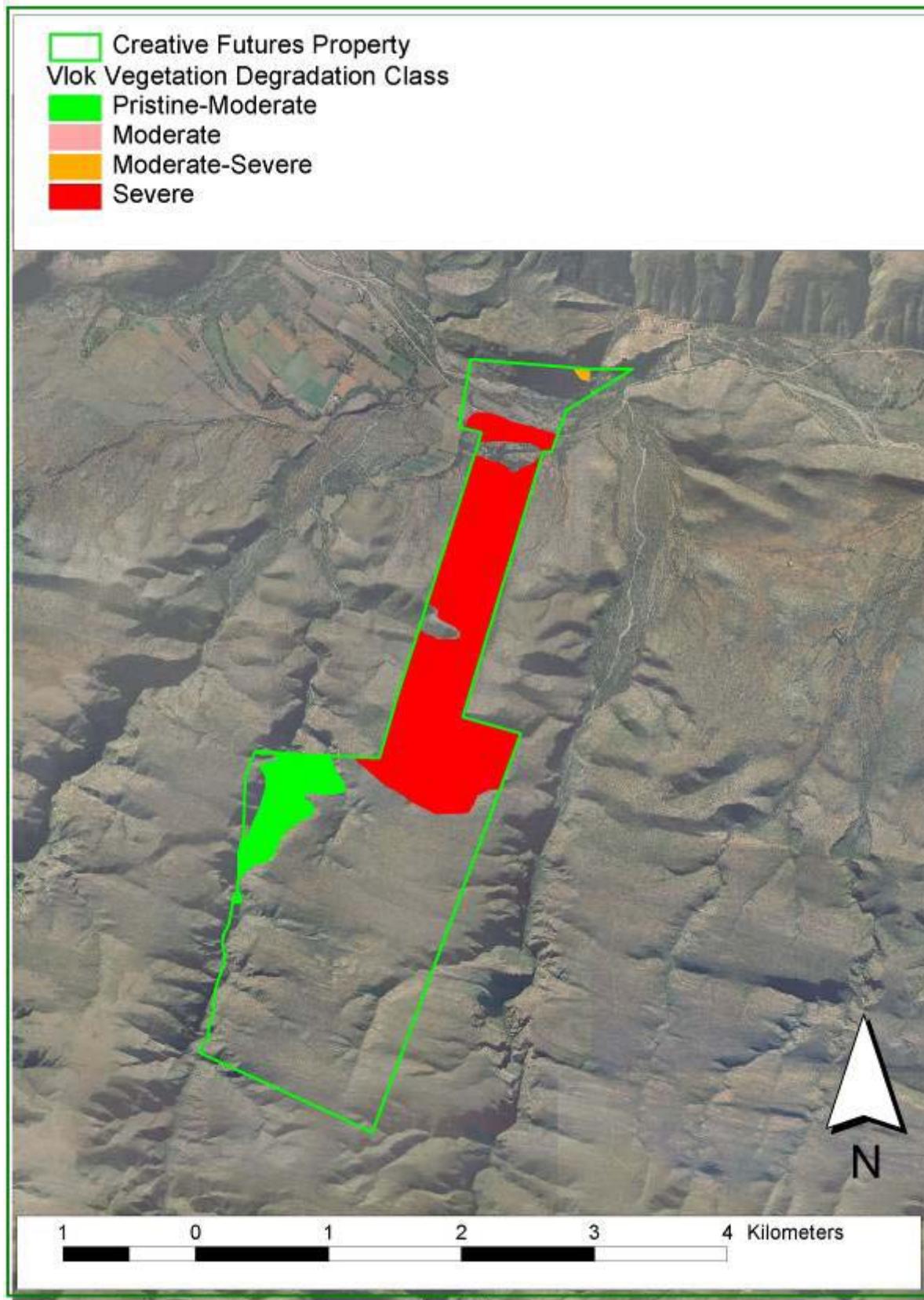
Appendix 4. Vegetation and degradation data for the Biddulph Property (Vlok 2010).

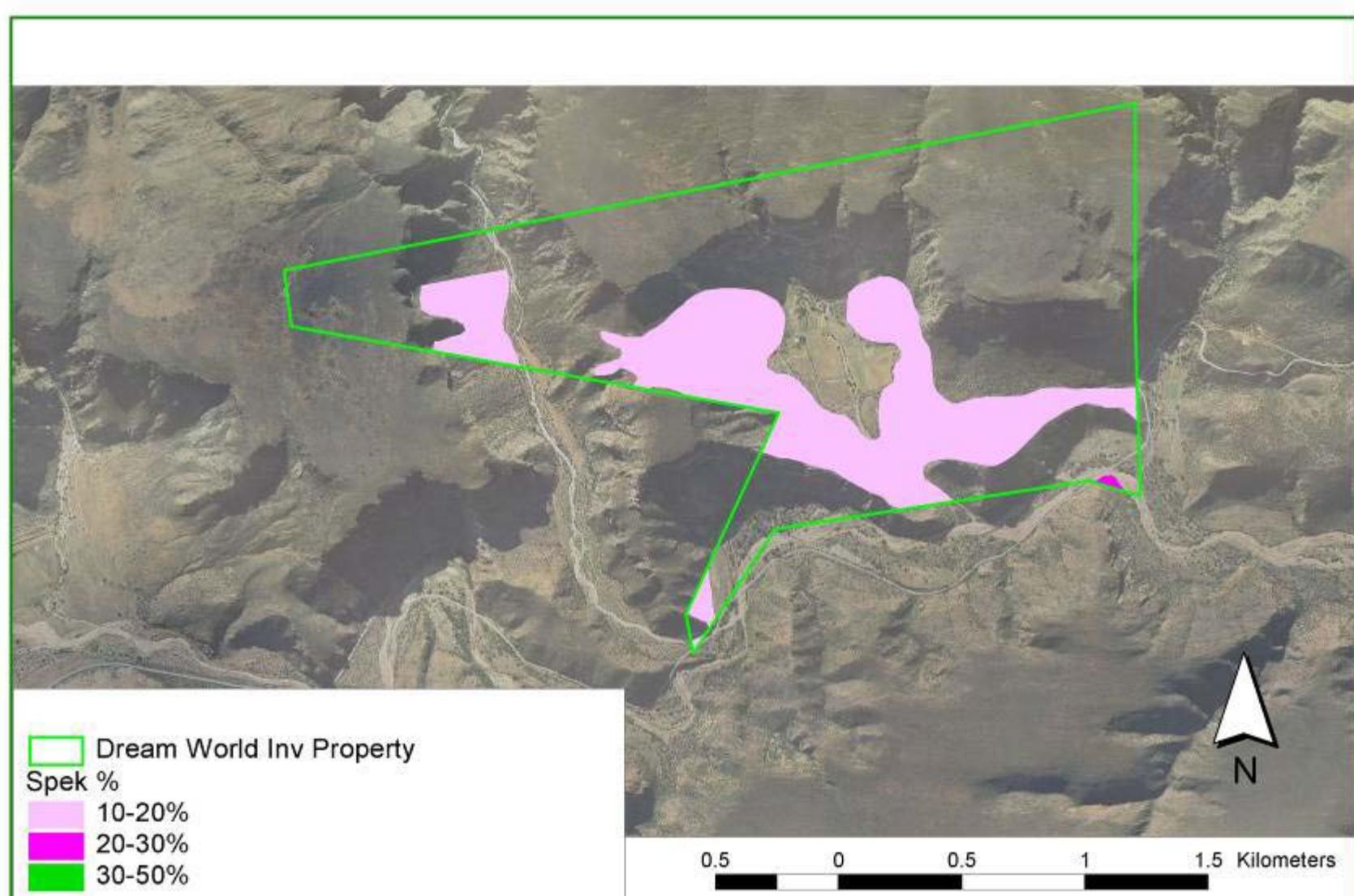
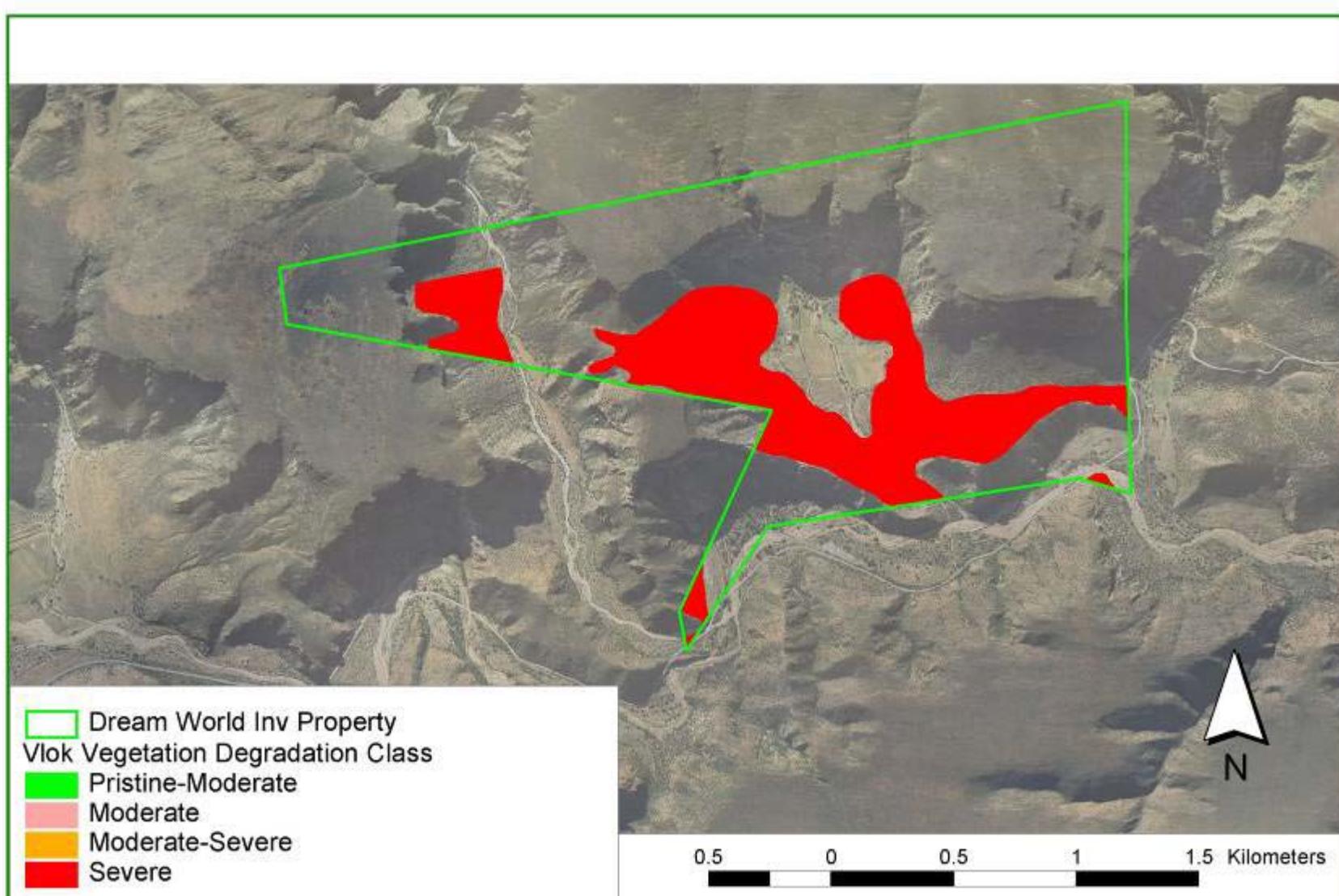


Appendix 5. Vegetation and degradation data for the Congregation Church Property (Vlok 2010).

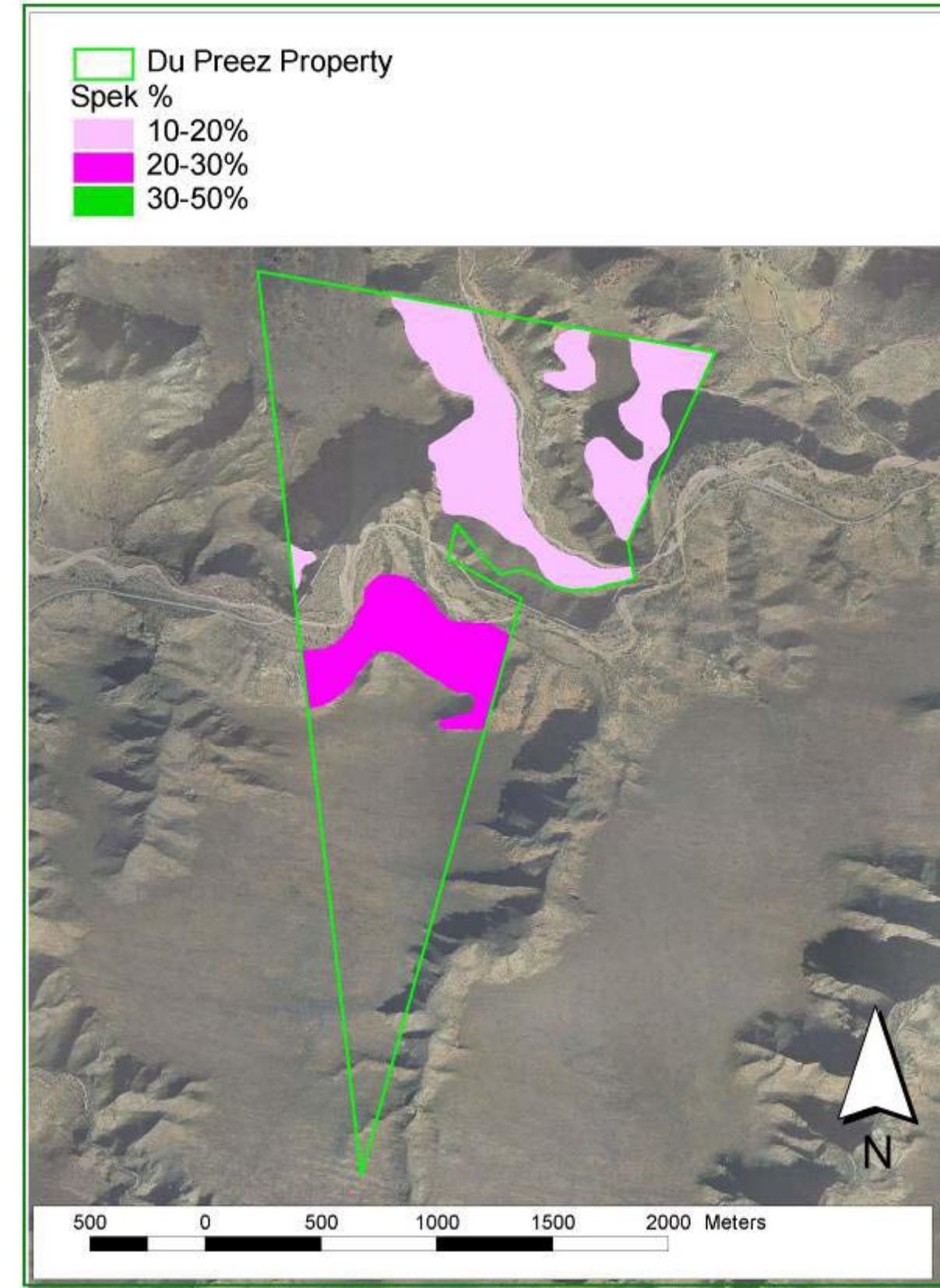
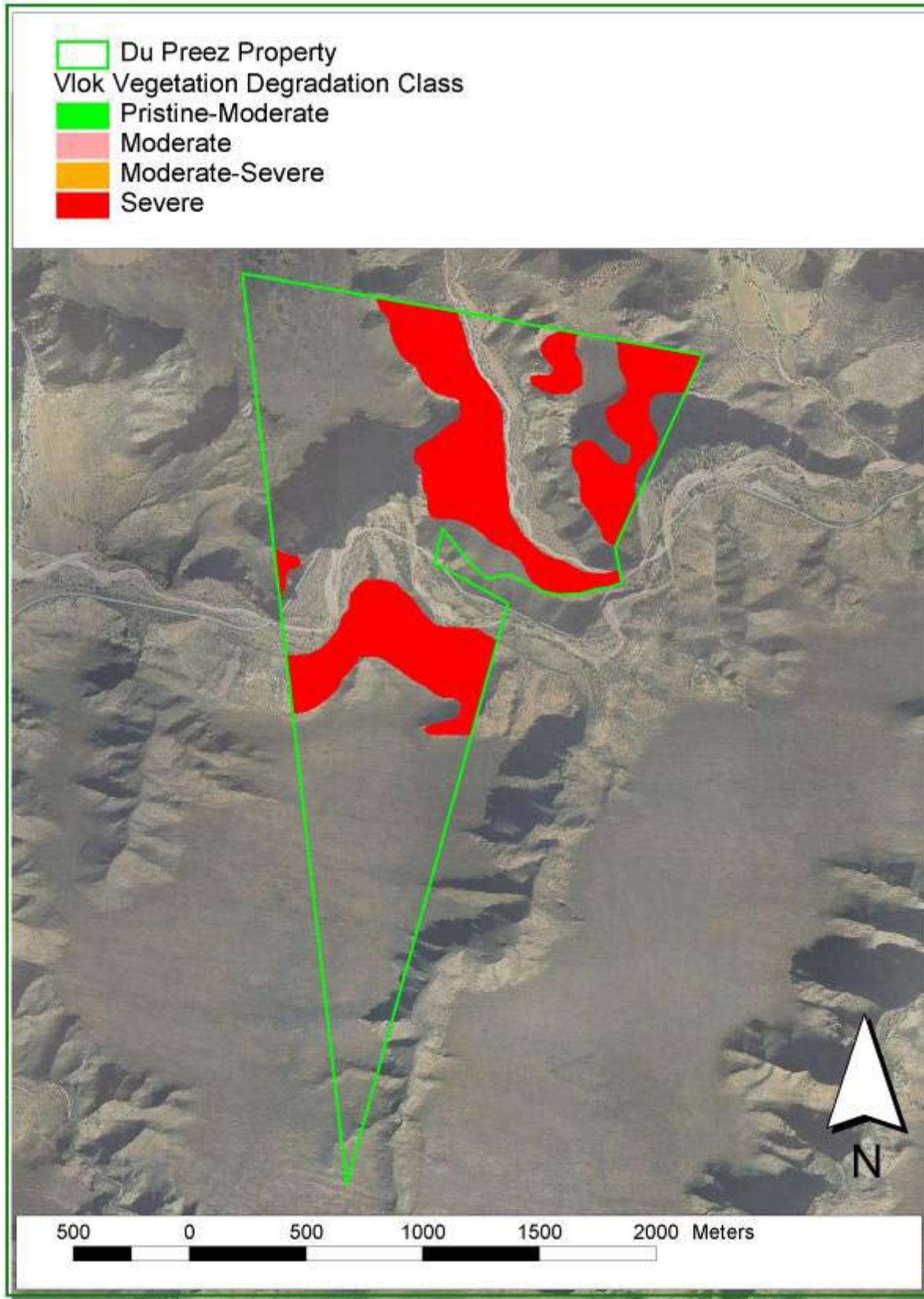


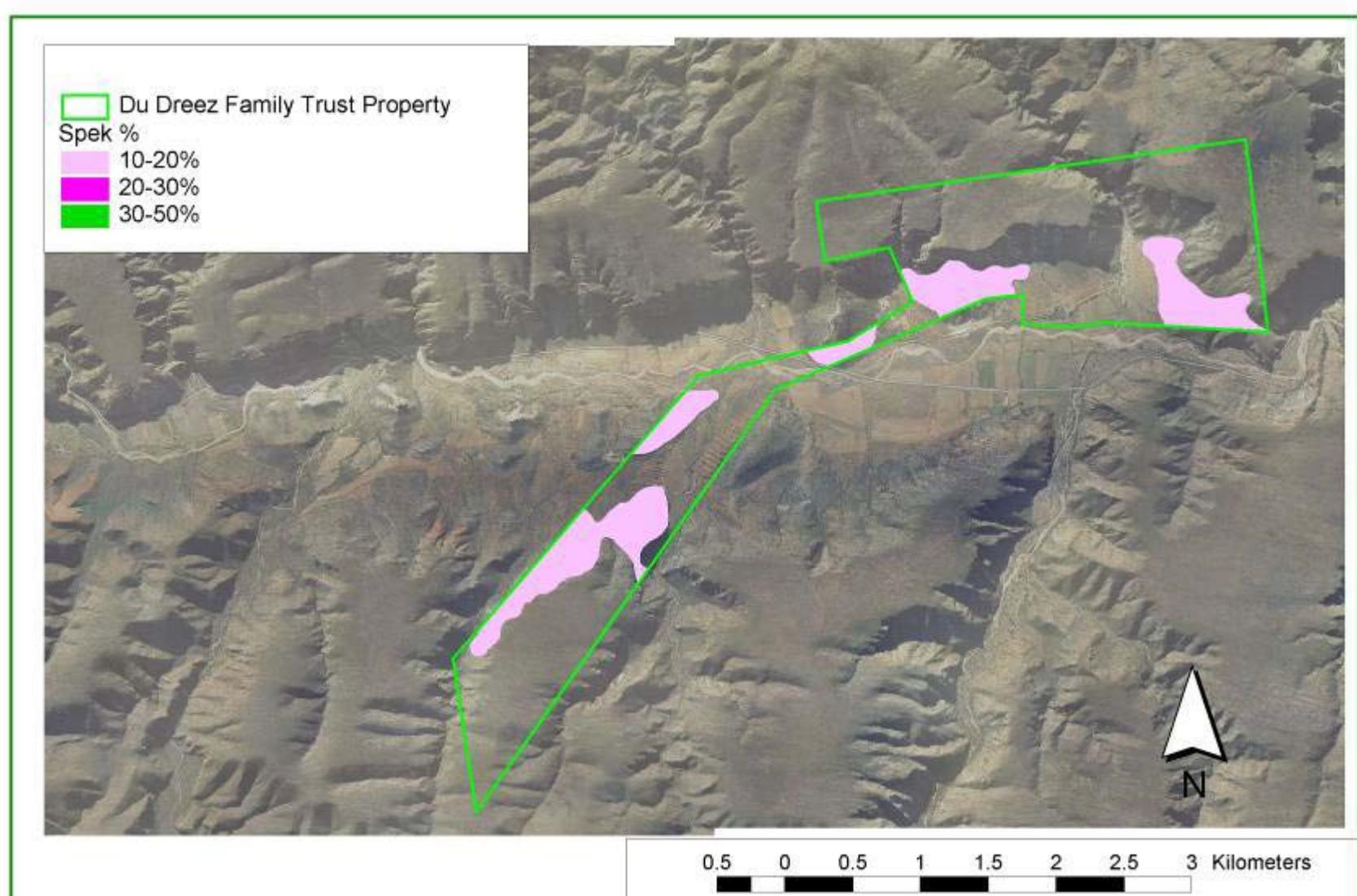
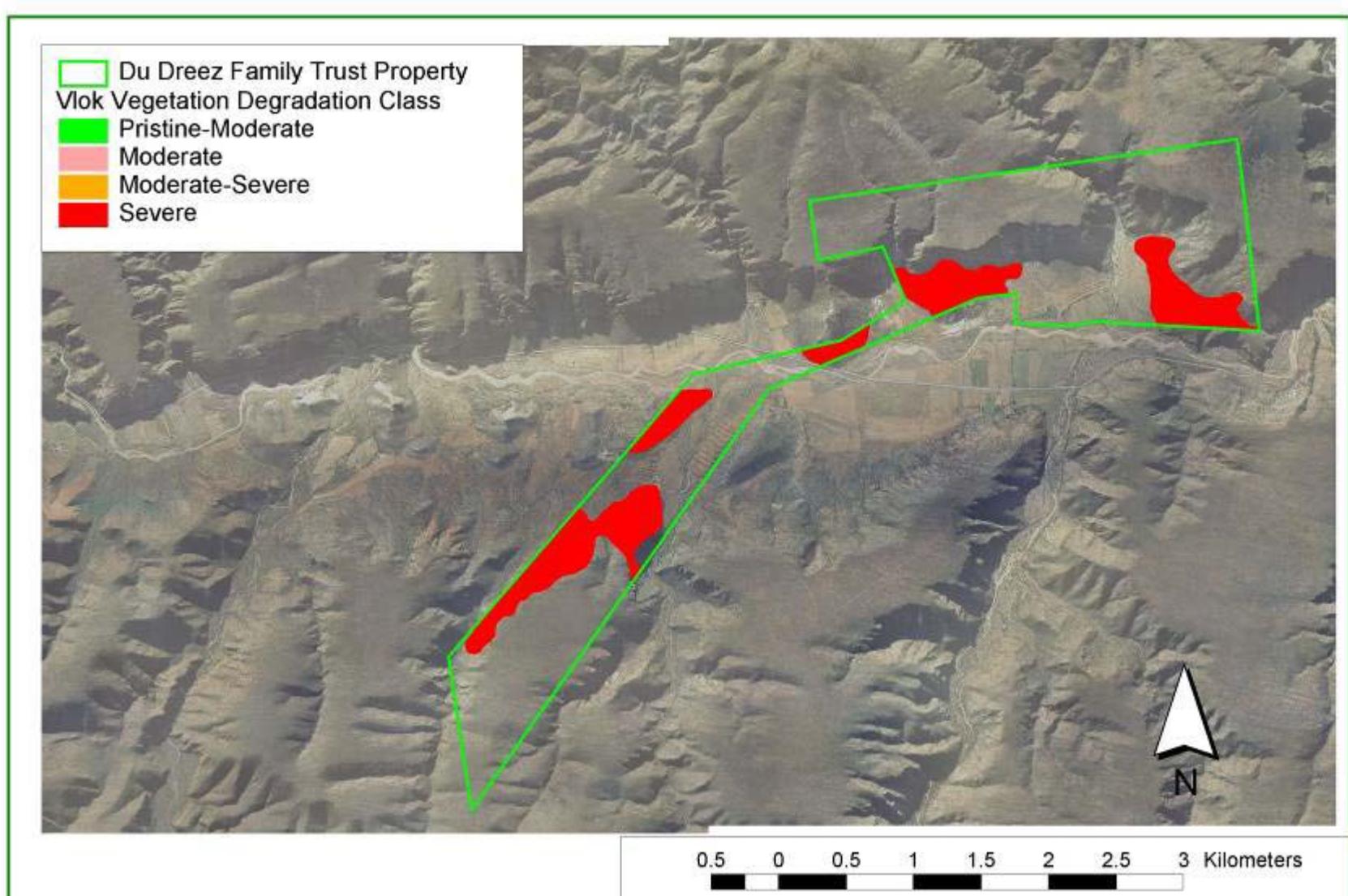
Appendix 6. Vegetation and degradation data for the Creative Futures Property (Vlok 2010).



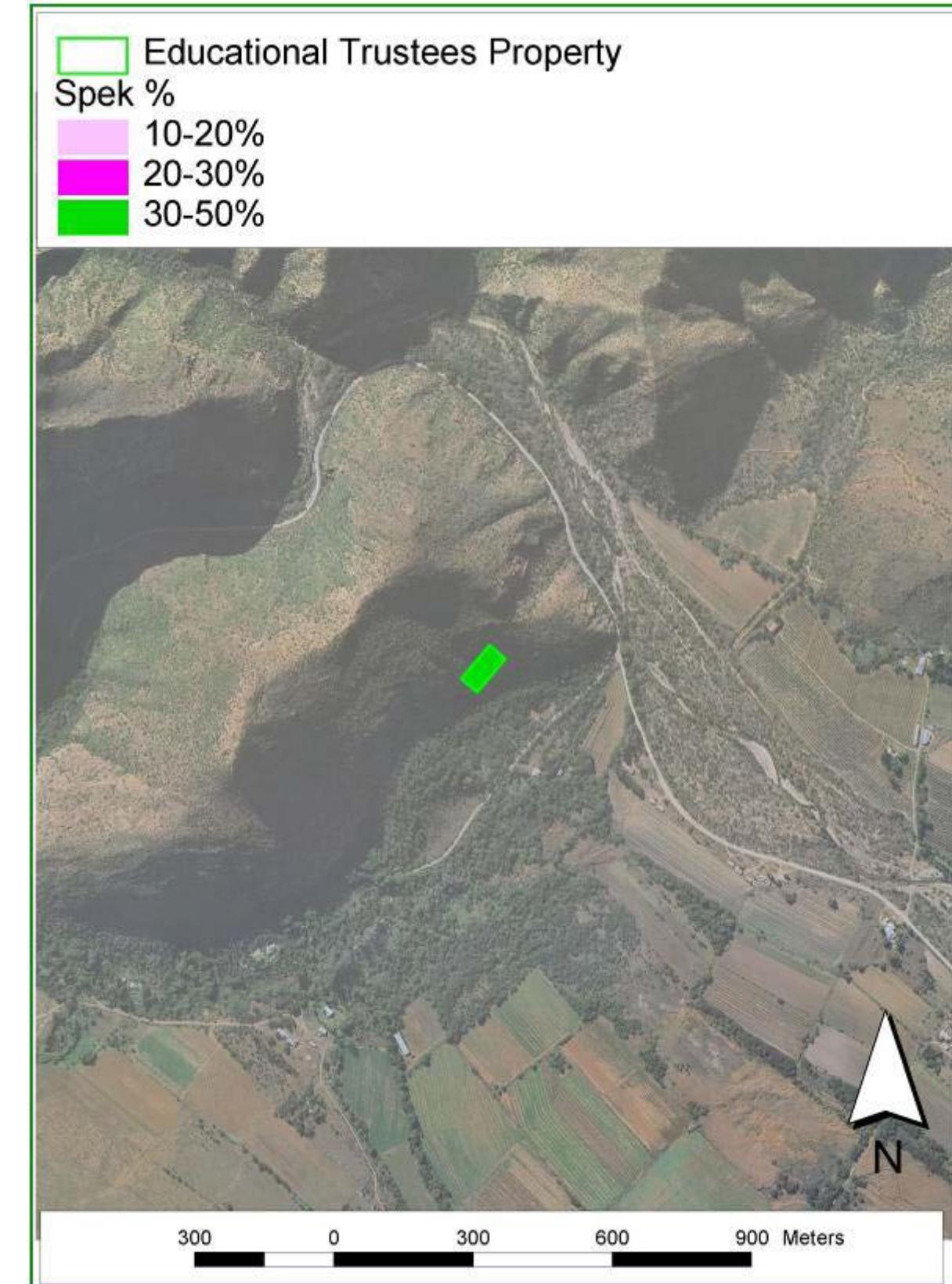
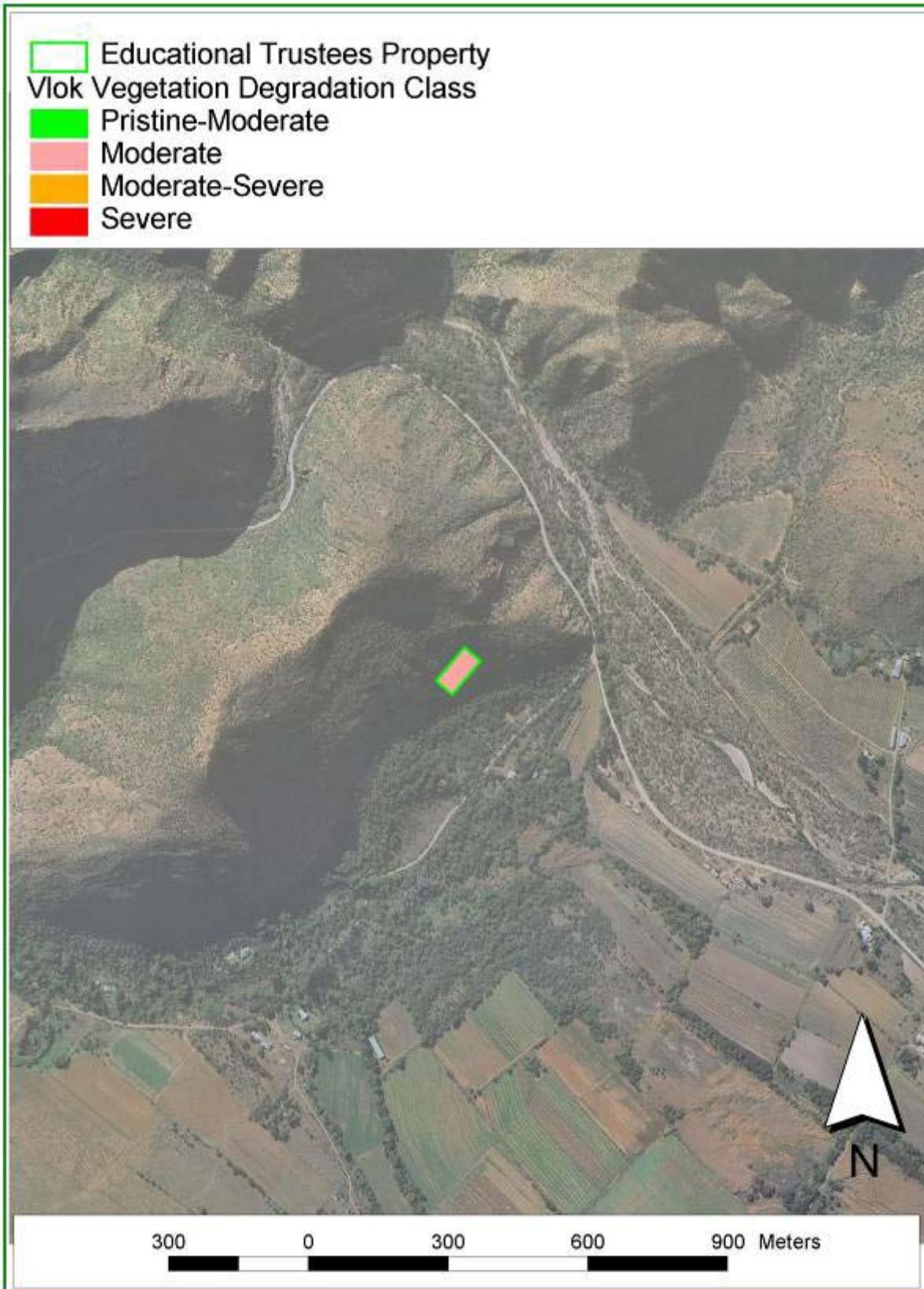
Appendix 7. Vegetation and degradation data for the Dream World Property ([Vlok 2010](#)).

Appendix 8. Vegetation and degradation data for the Du Preez Property (Vlok 2010).

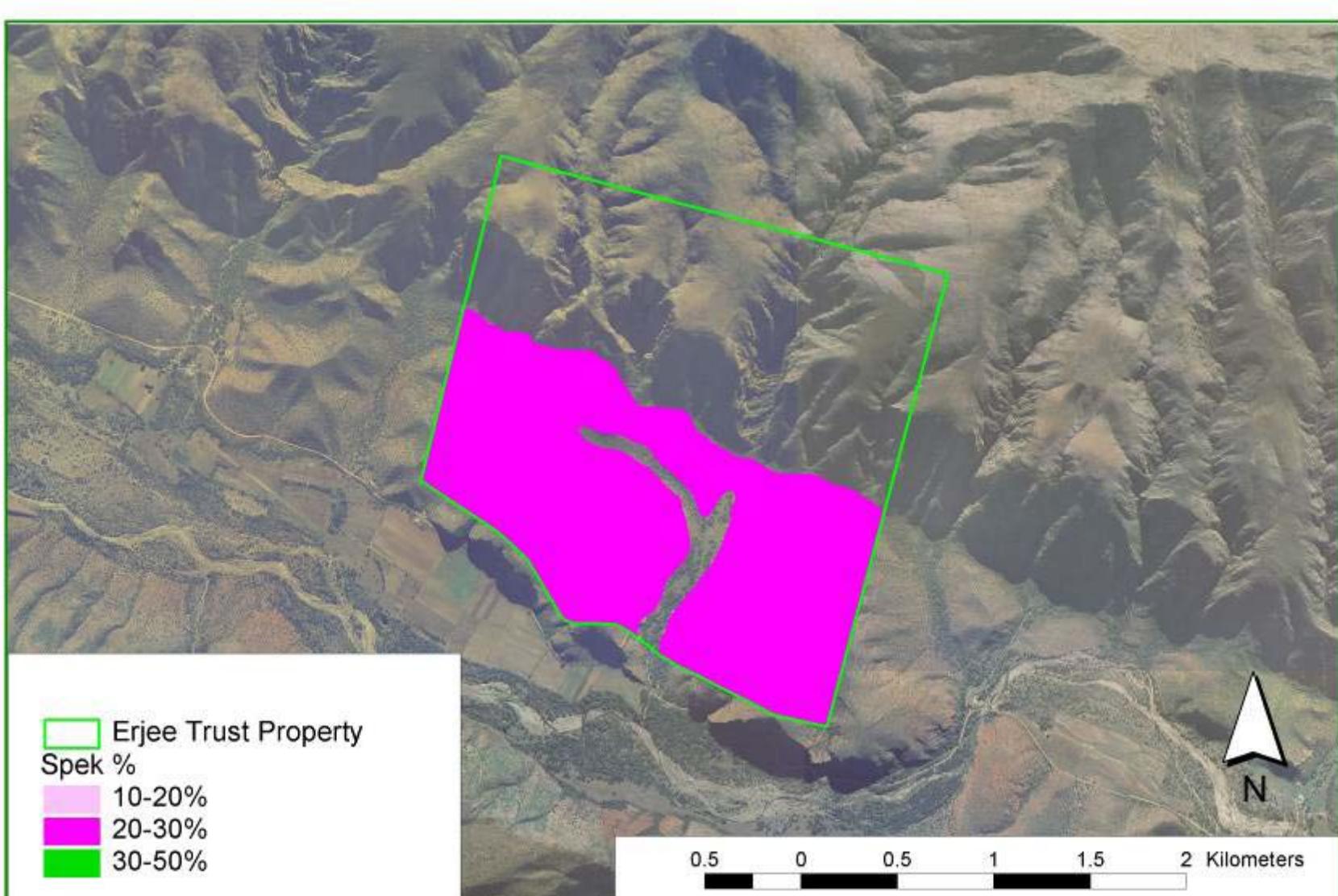
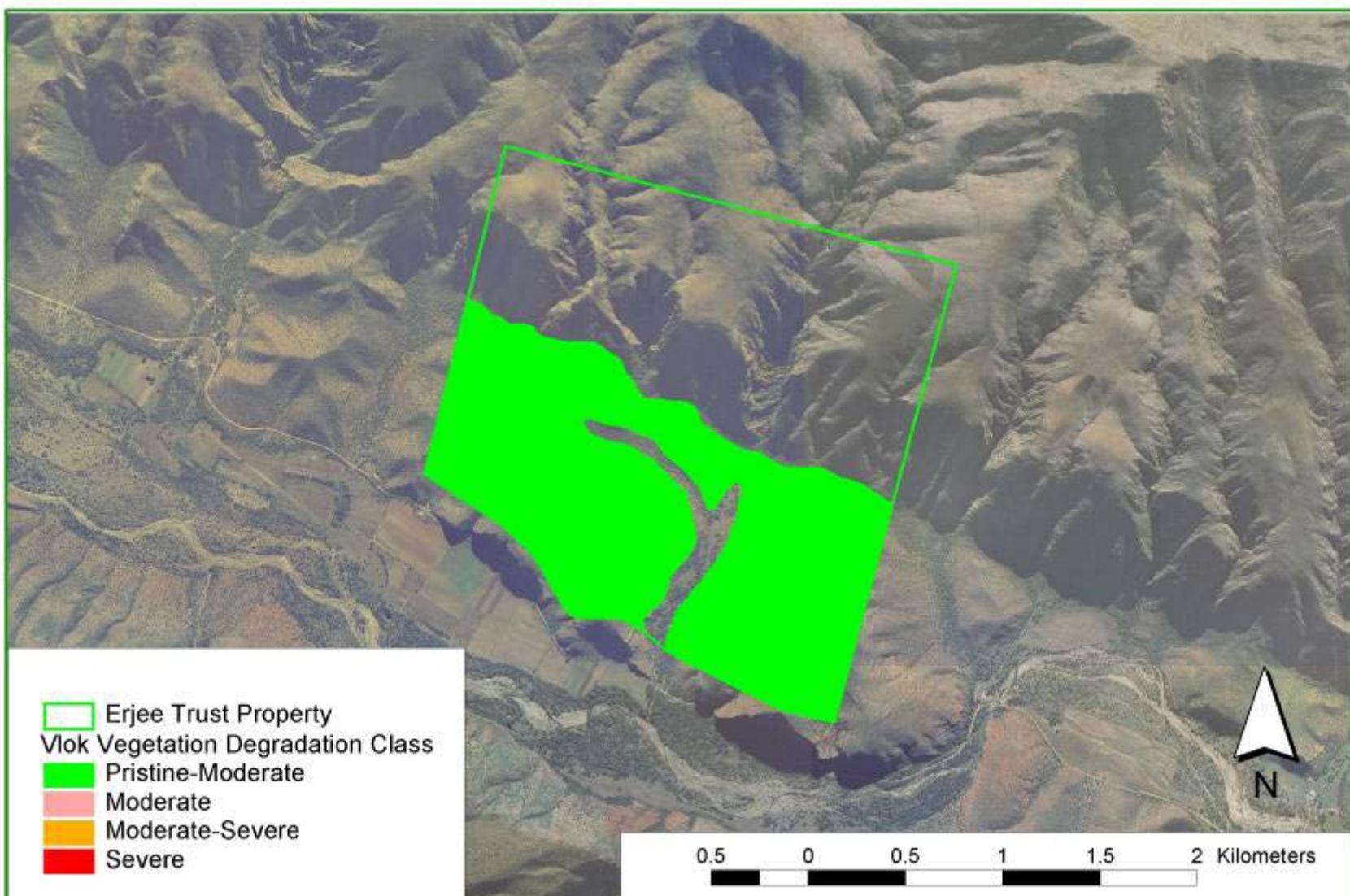


Appendix 9. Vegetation and degradation data for the Du Preez Family Trust Property ([Vlok 2010](#)).

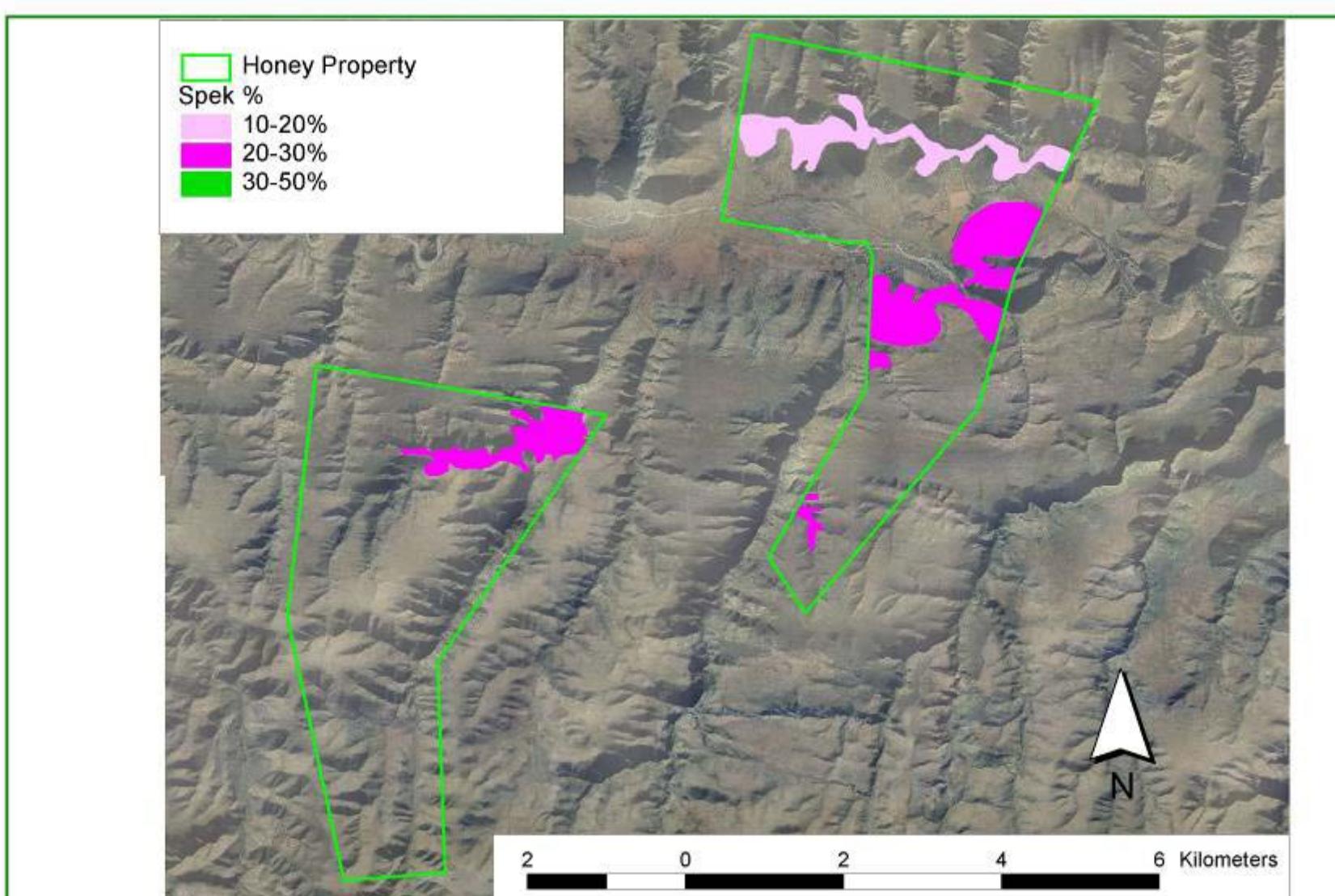
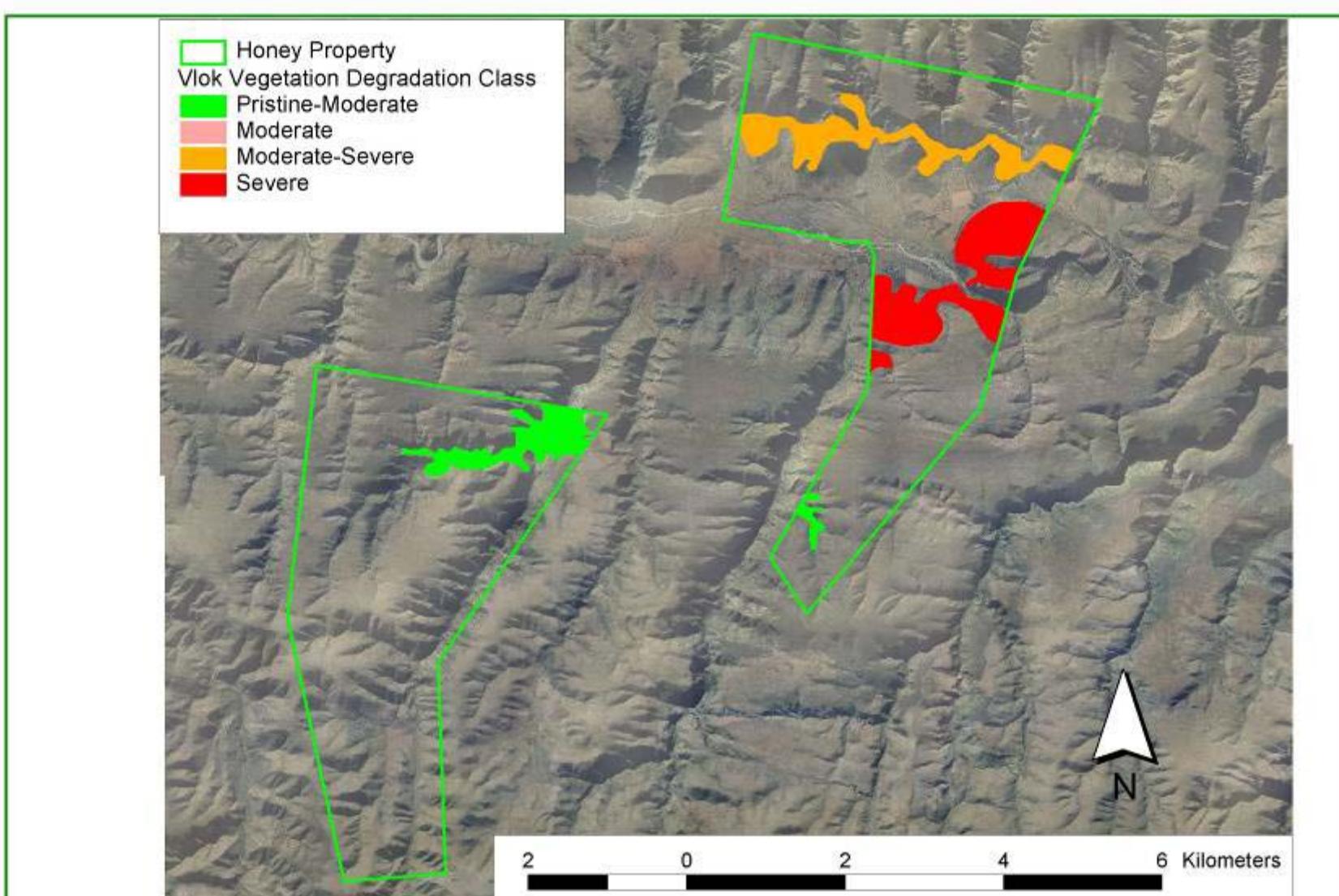
Appendix 10. Vegetation and degradation data for the Educational Trust Property (Vlok 2010).

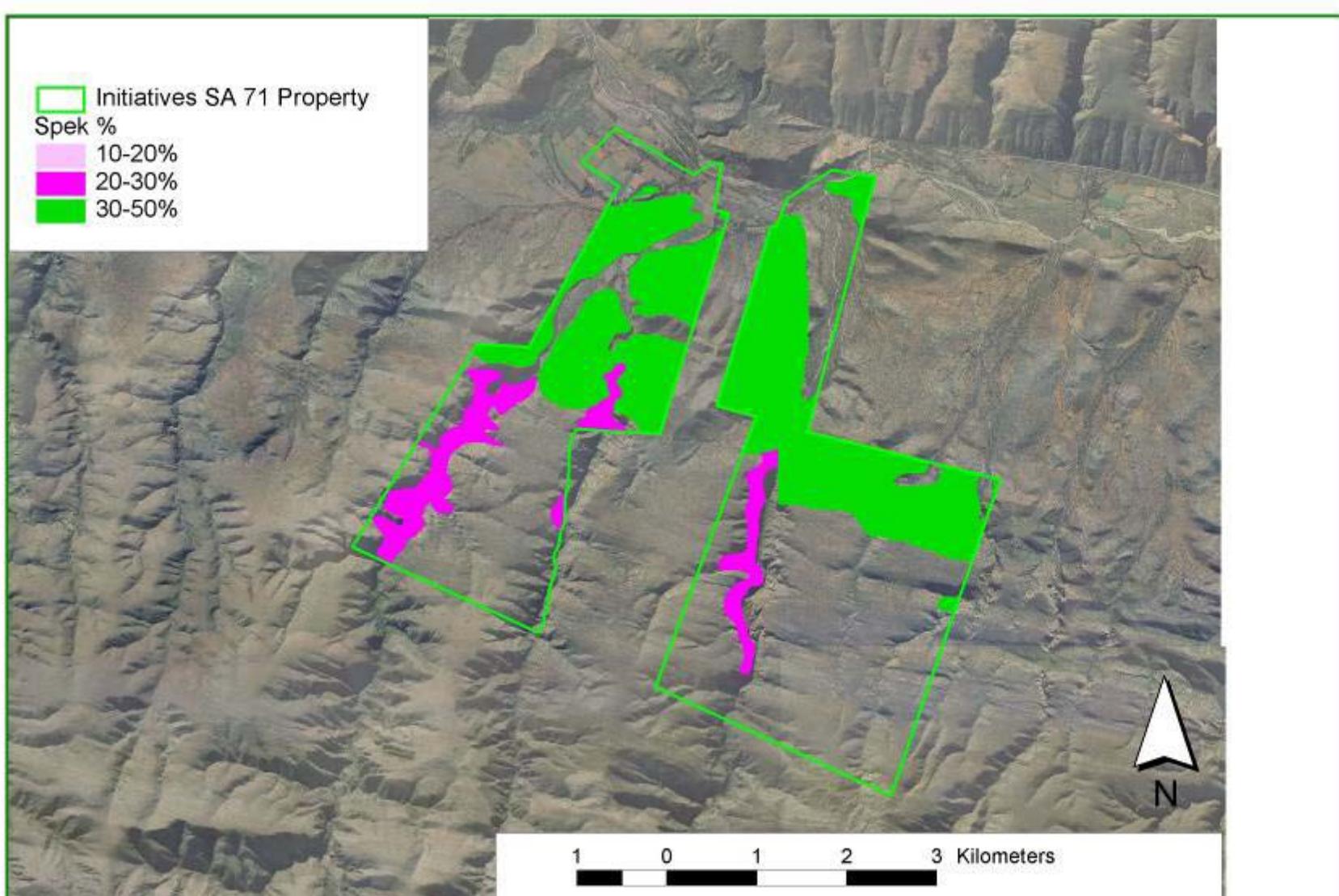
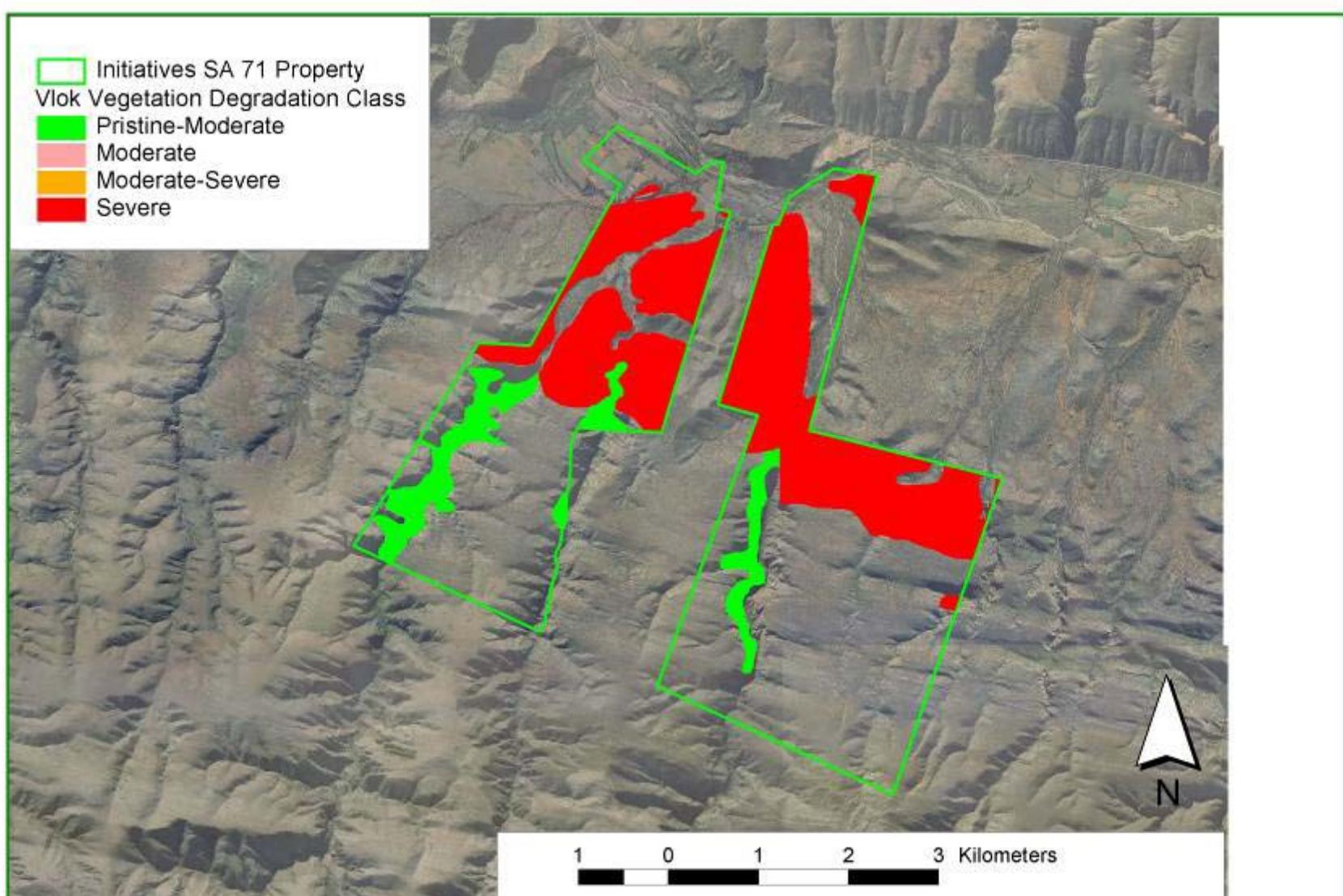


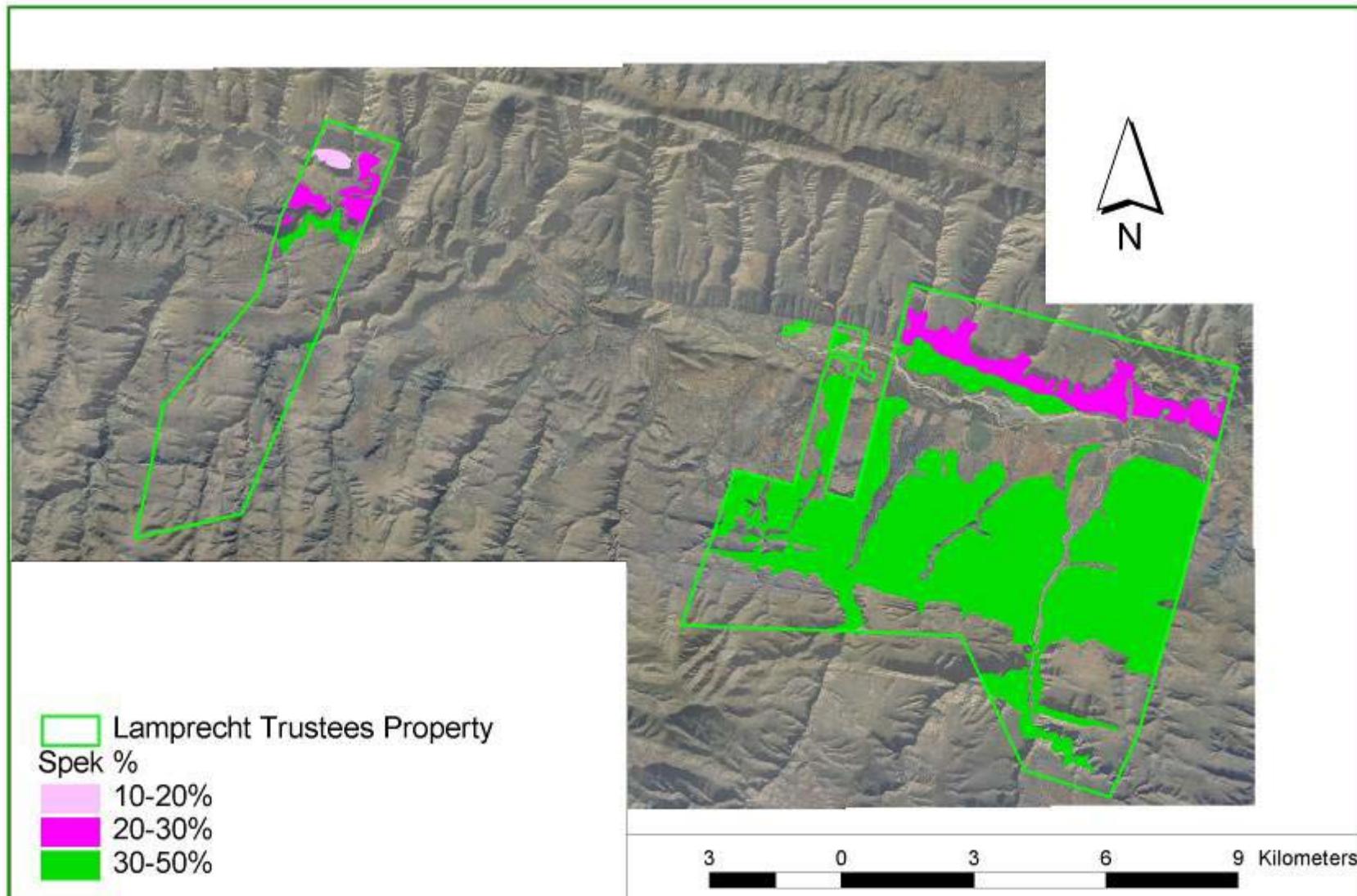
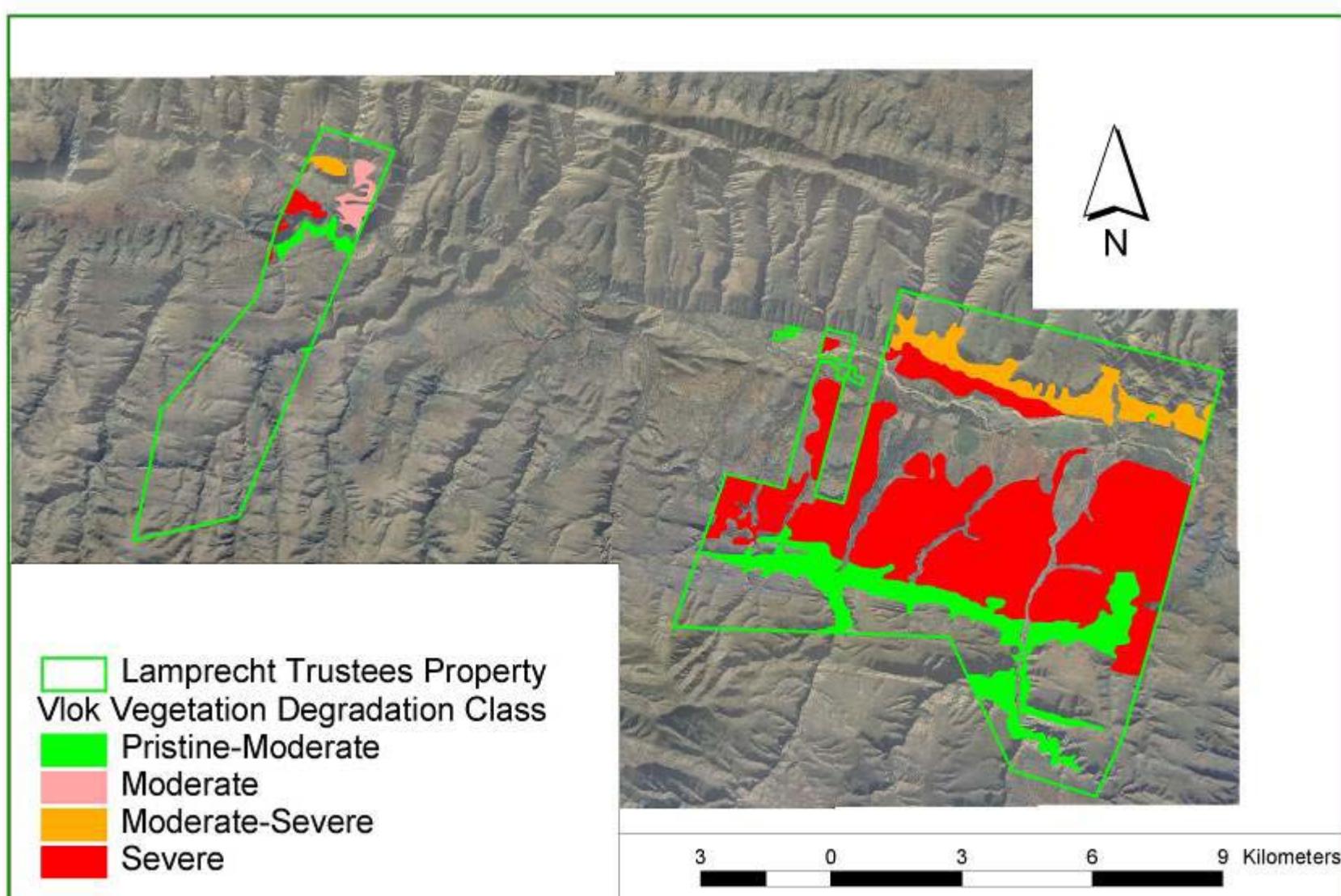
Appendix 11. Vegetation and degradation data for the Erjee Trust Property (Vlok 2010).



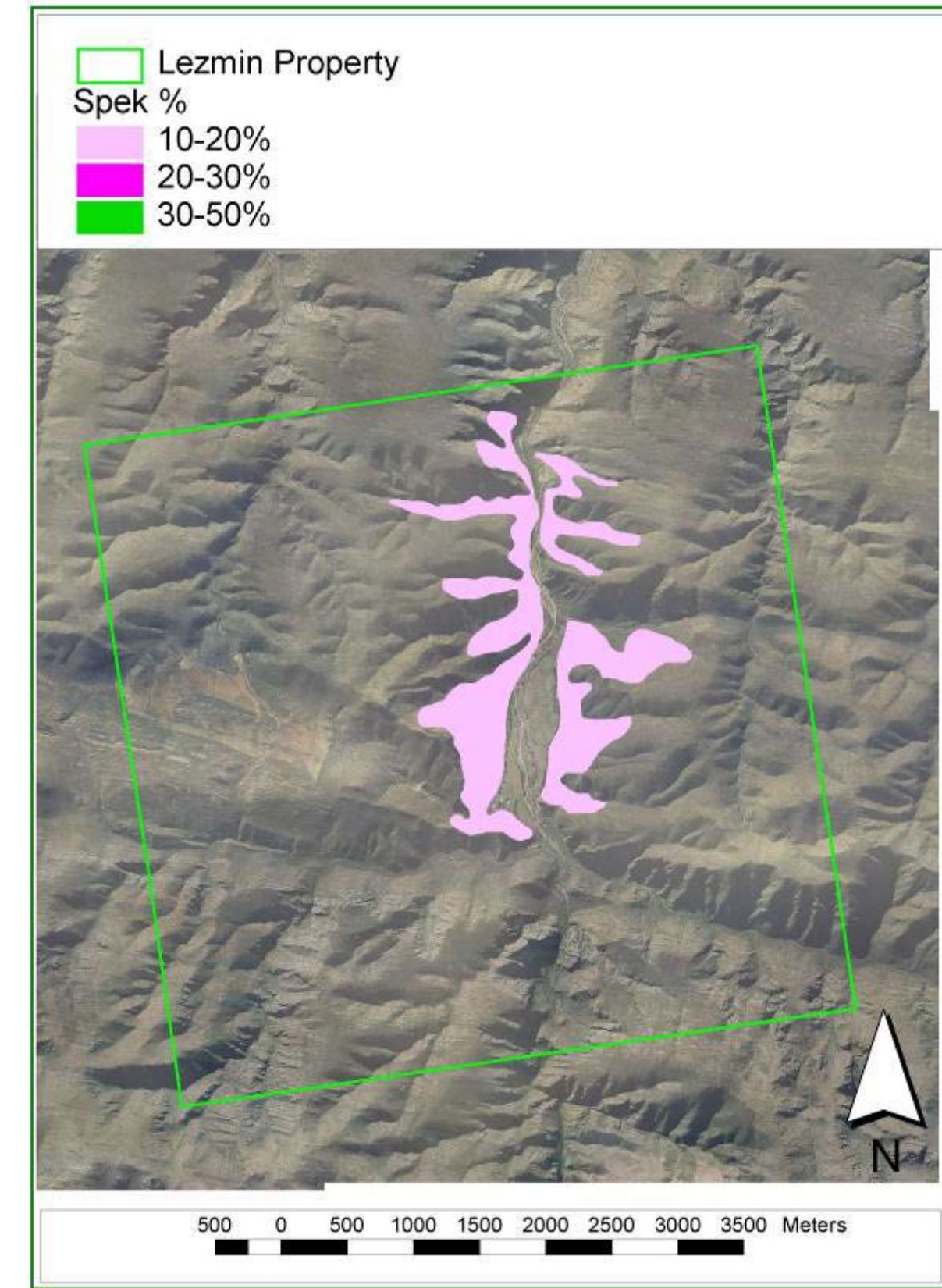
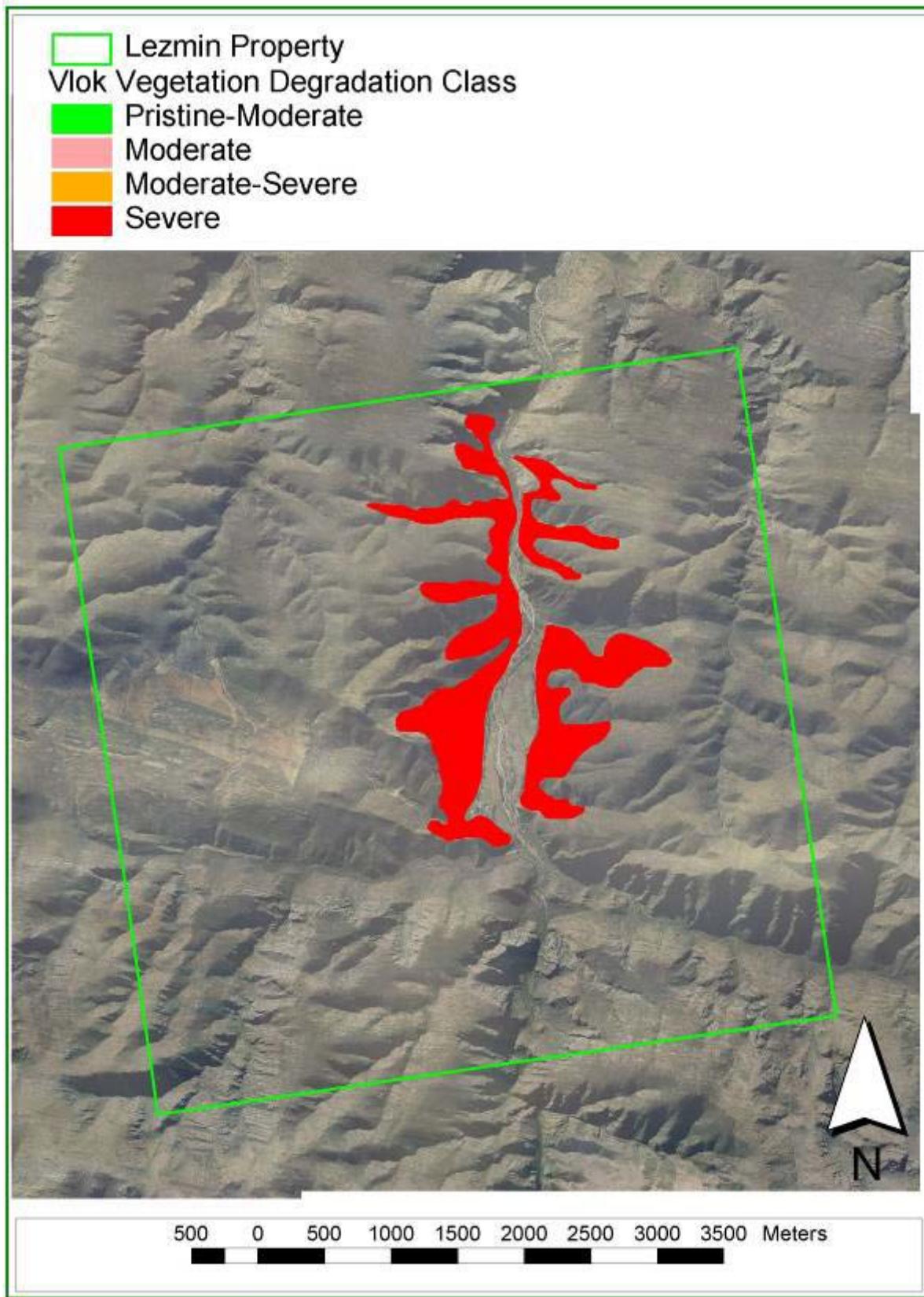
Appendix 12. Vegetation and degradation data for the Honey Property (Vlok 2010).

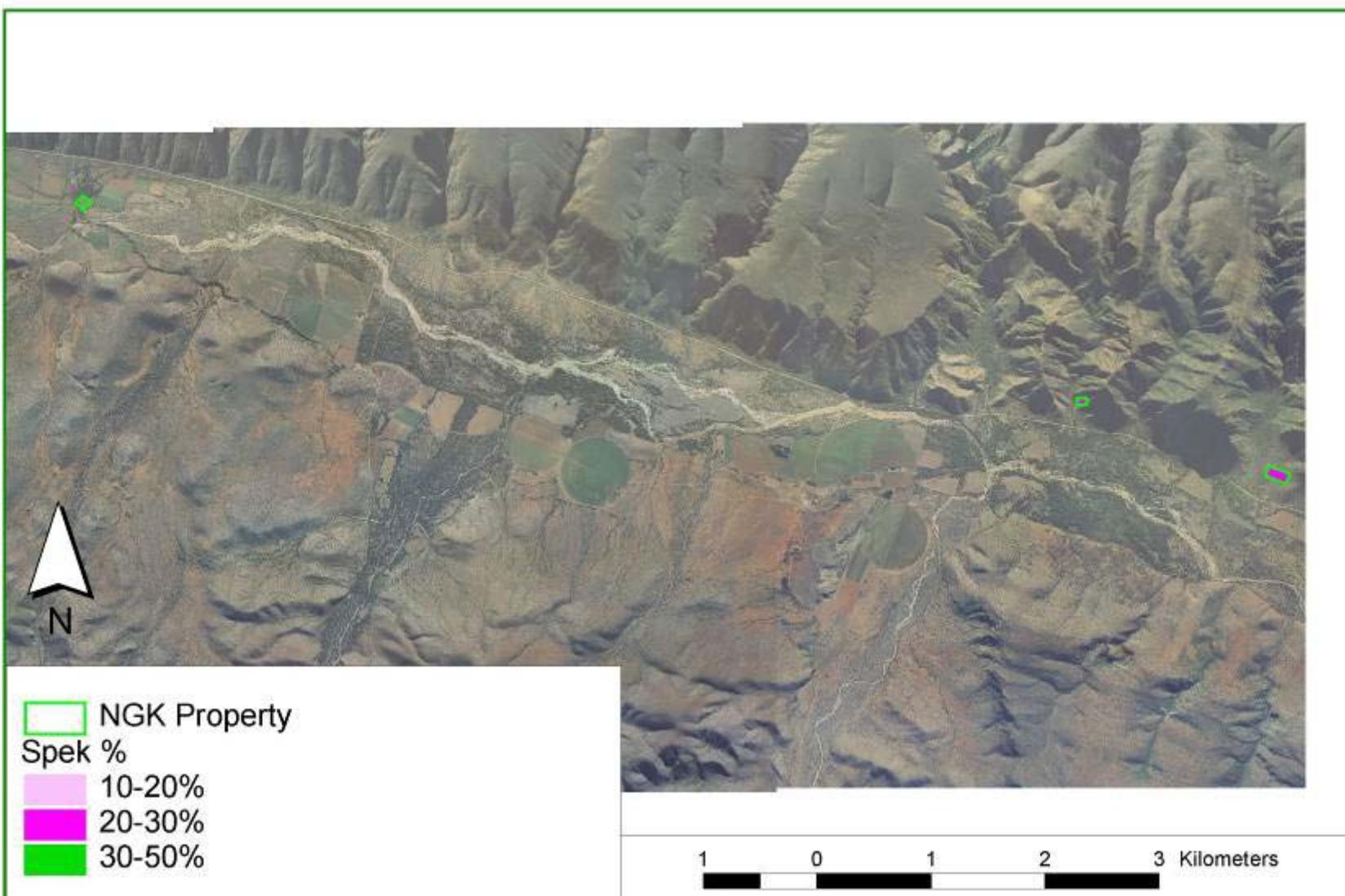
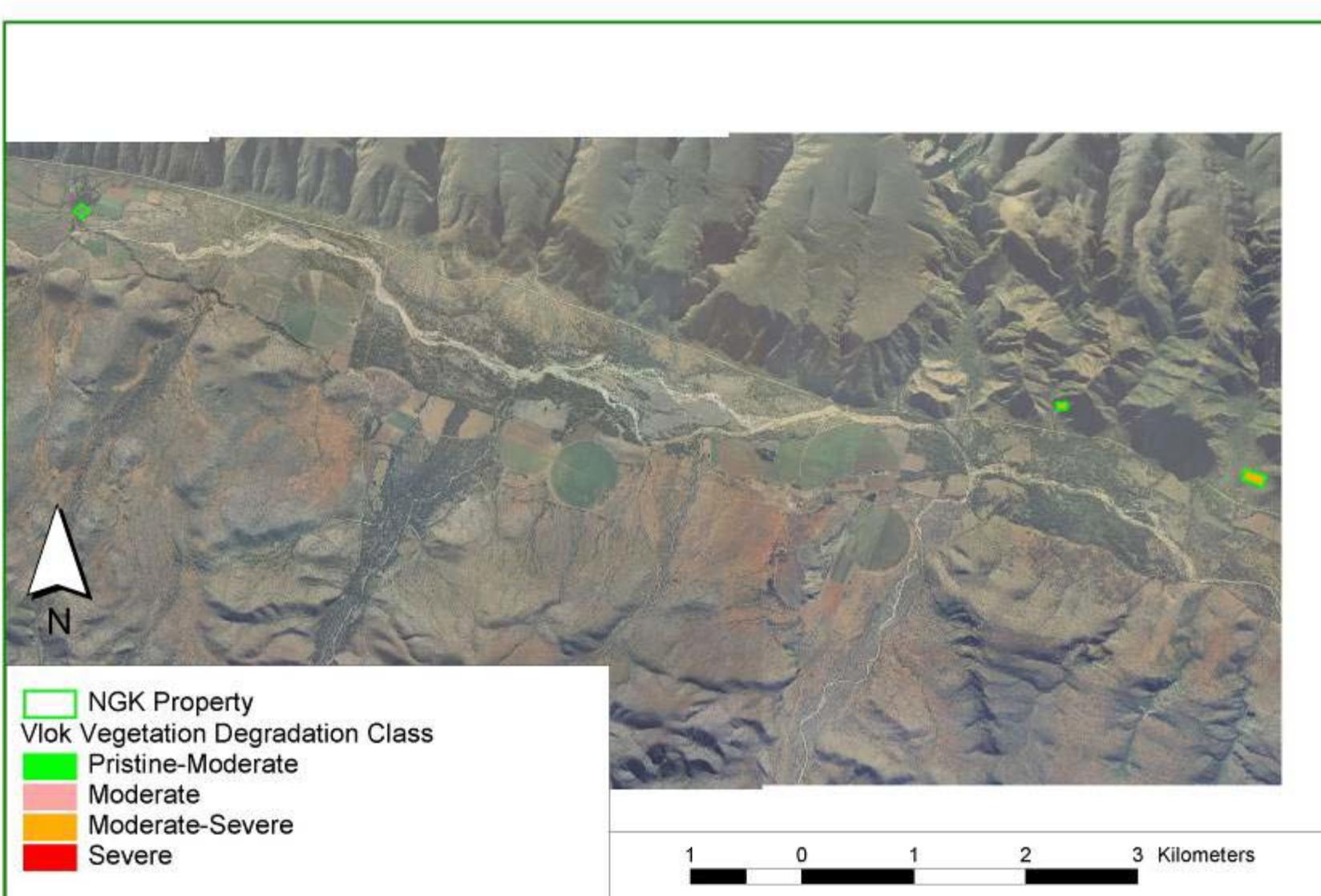


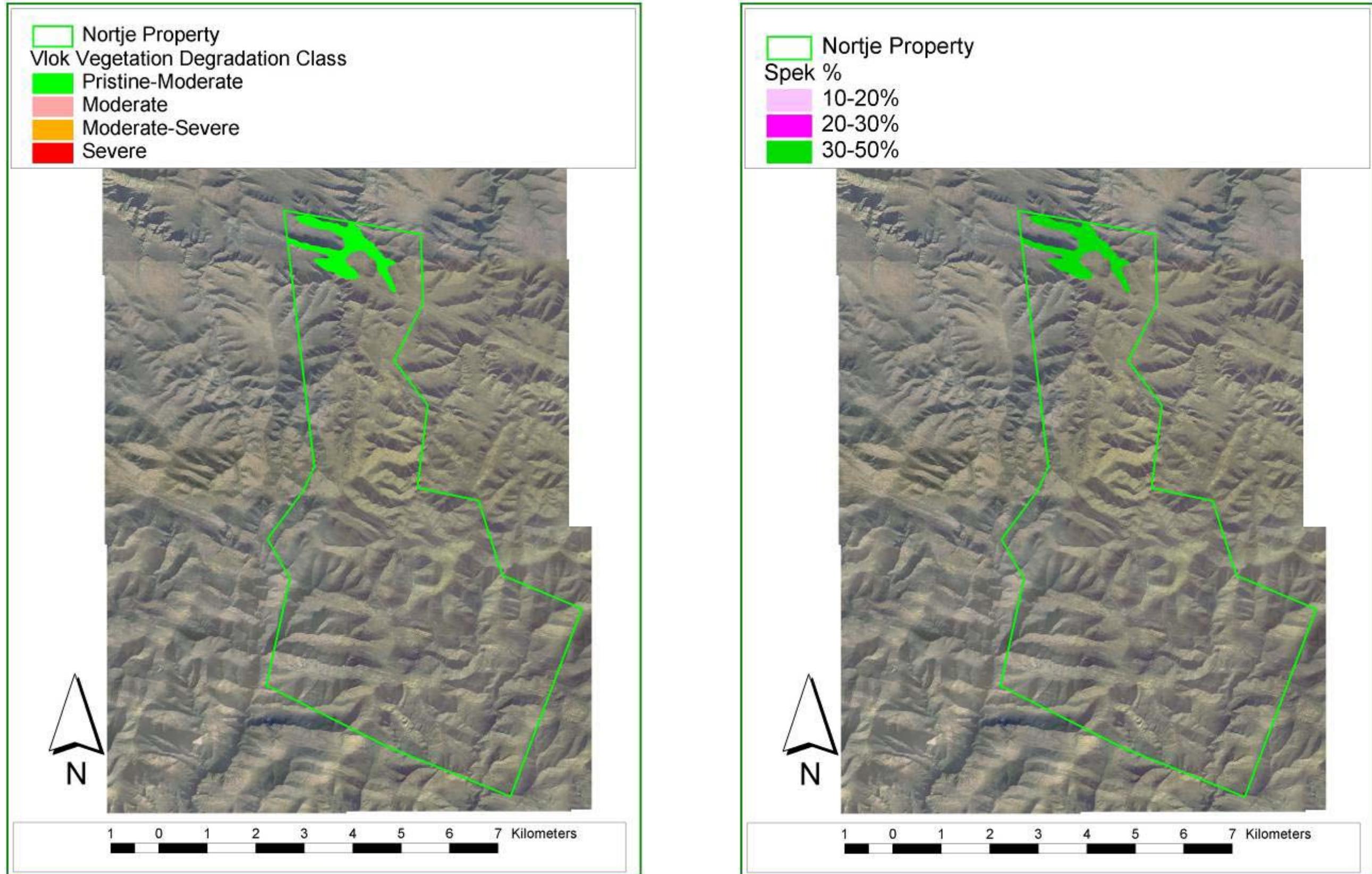
Appendix 13. Vegetation and degradation data for the Initiatives SA Property ([Vlok 2010](#)).

Appendix 14. Vegetation and degradation data for the Lamprechts Property ([Vlok 2010](#)).

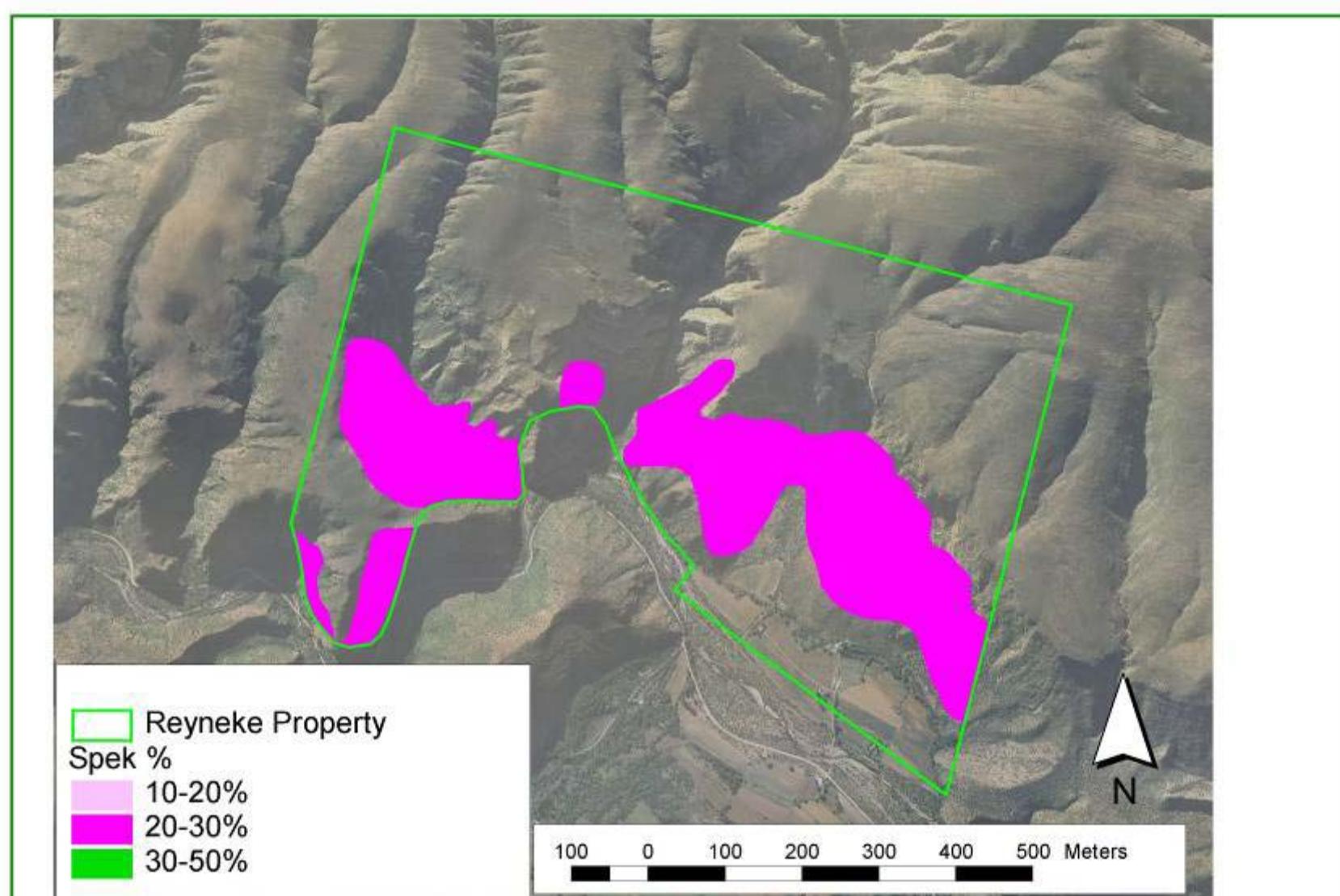
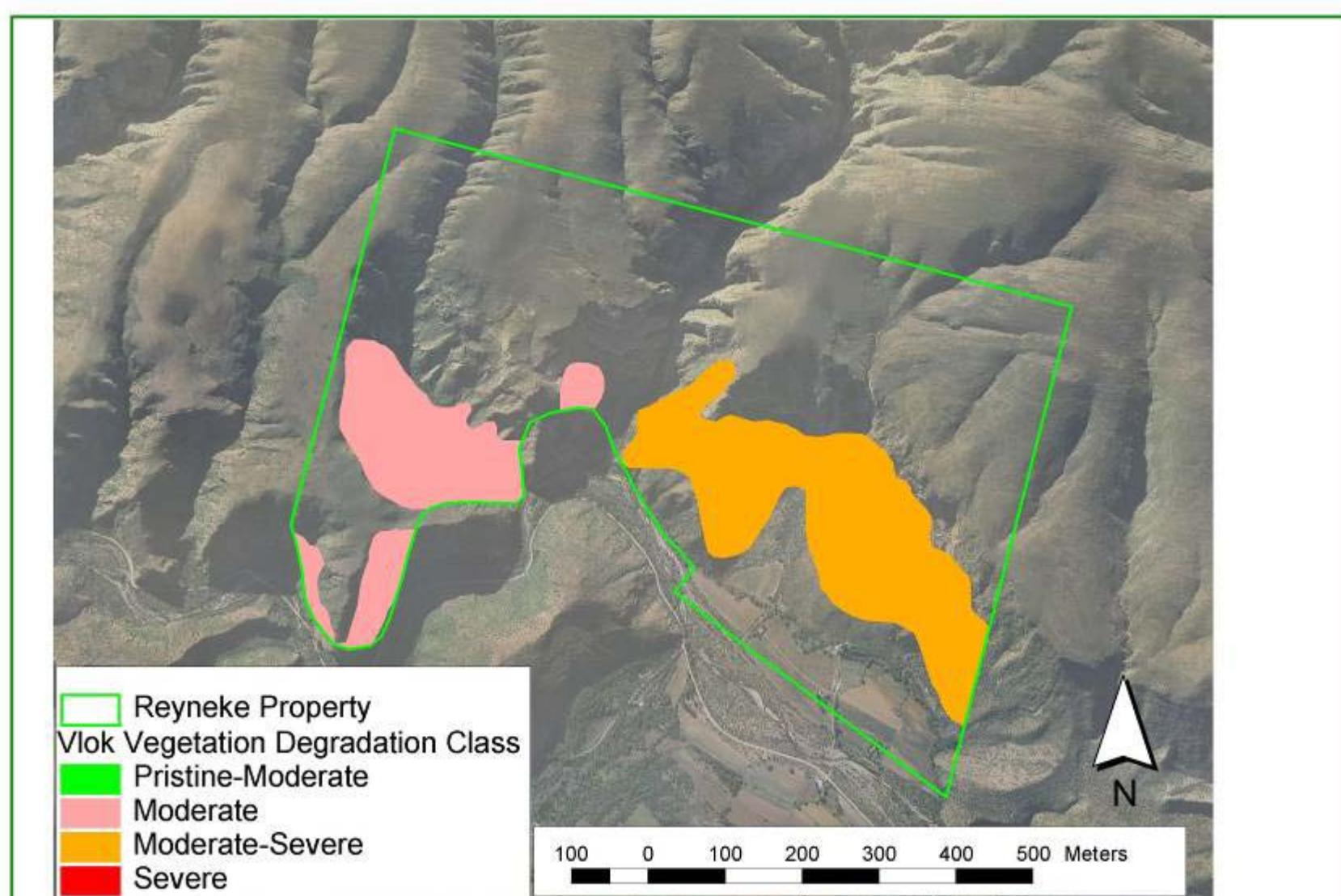
Appendix 15. Vegetation and degradation data for the Lezmin Property (Vlok 2010).



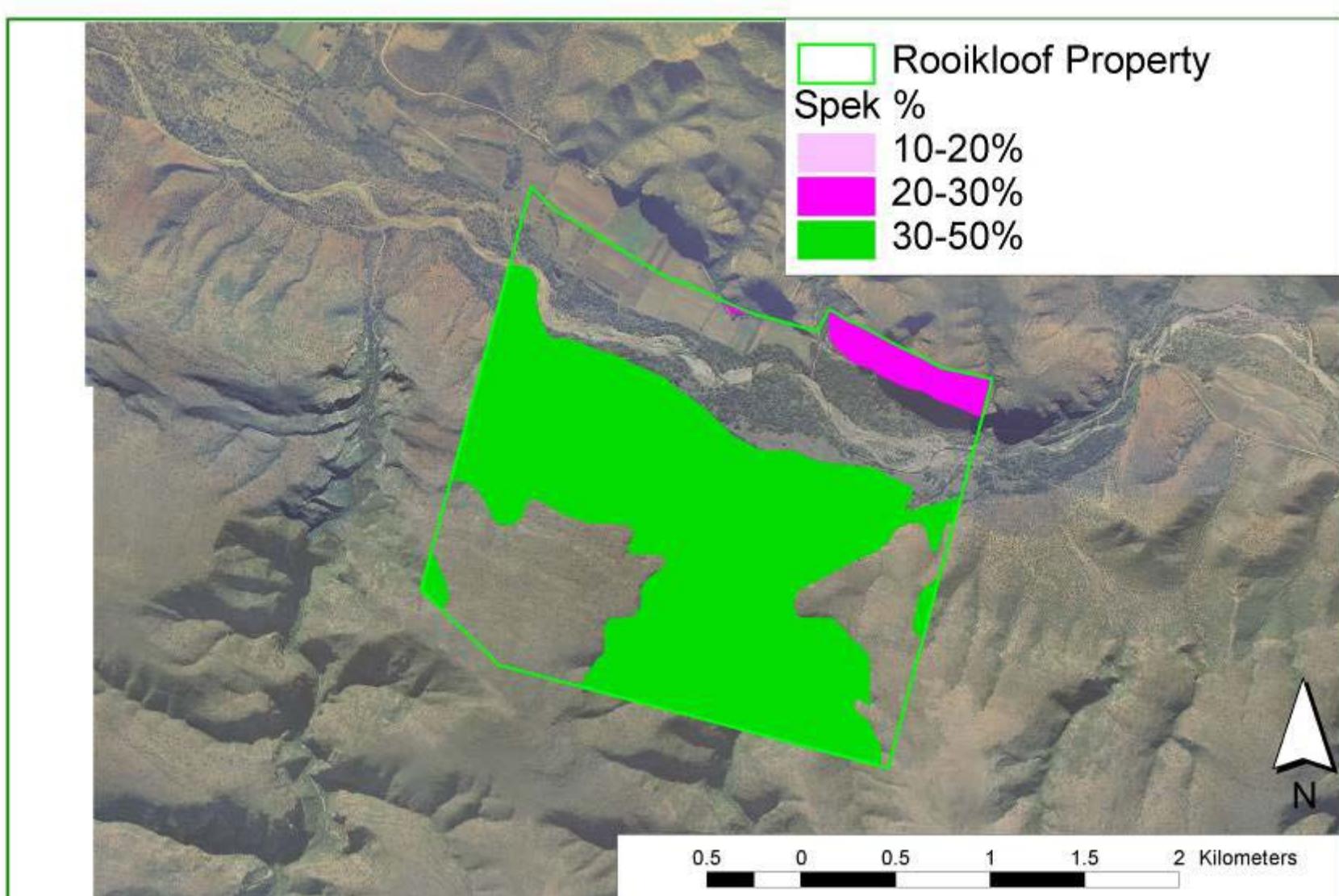
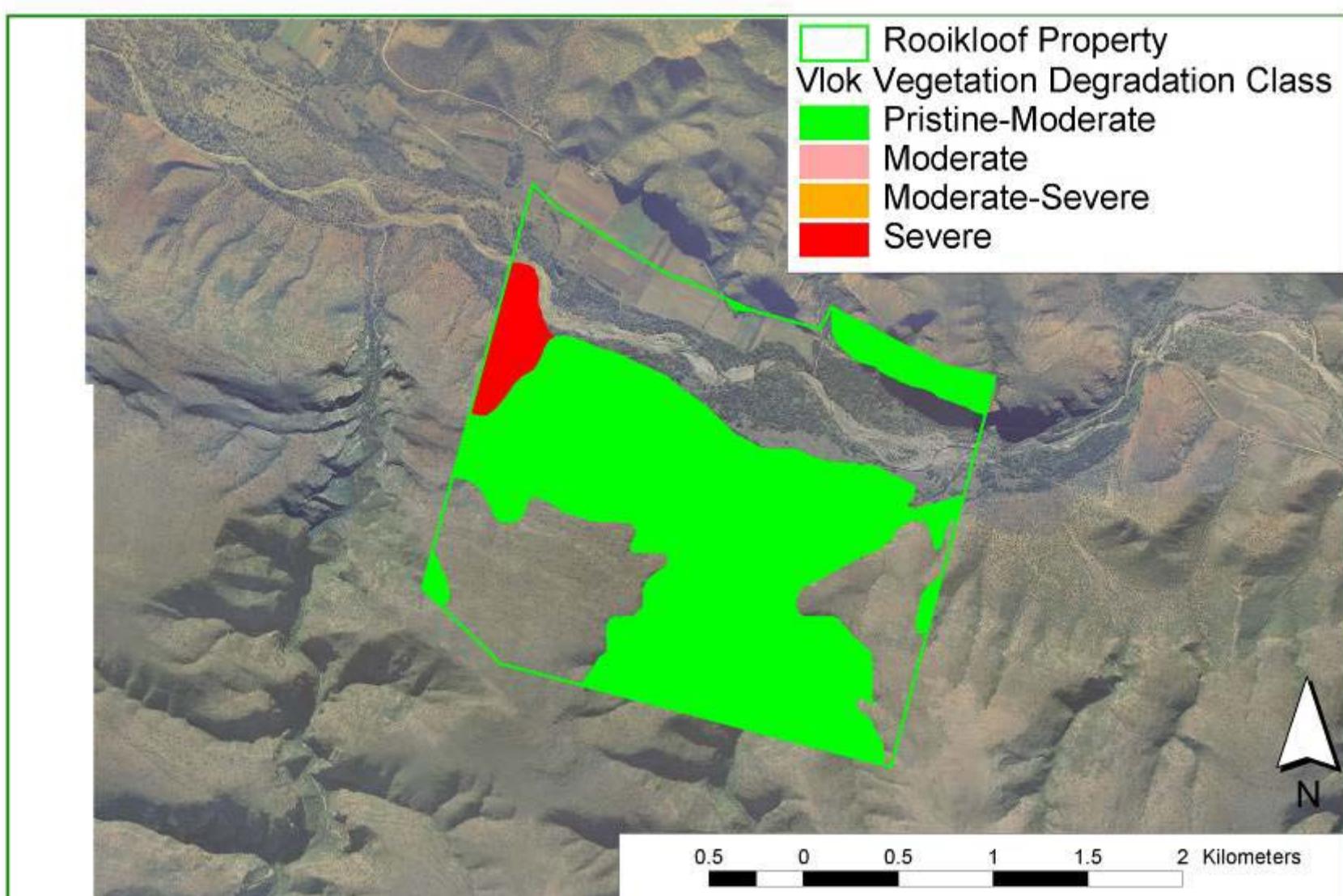
Appendix 16. Vegetation and degradation data for the NEDERDUTS GEREFORMEERDE KERK Property ([Vlok 2010](#)).

Appendix 17. Vegetation and degradation data for the Nortje Property ([Vlok 2010](#)).

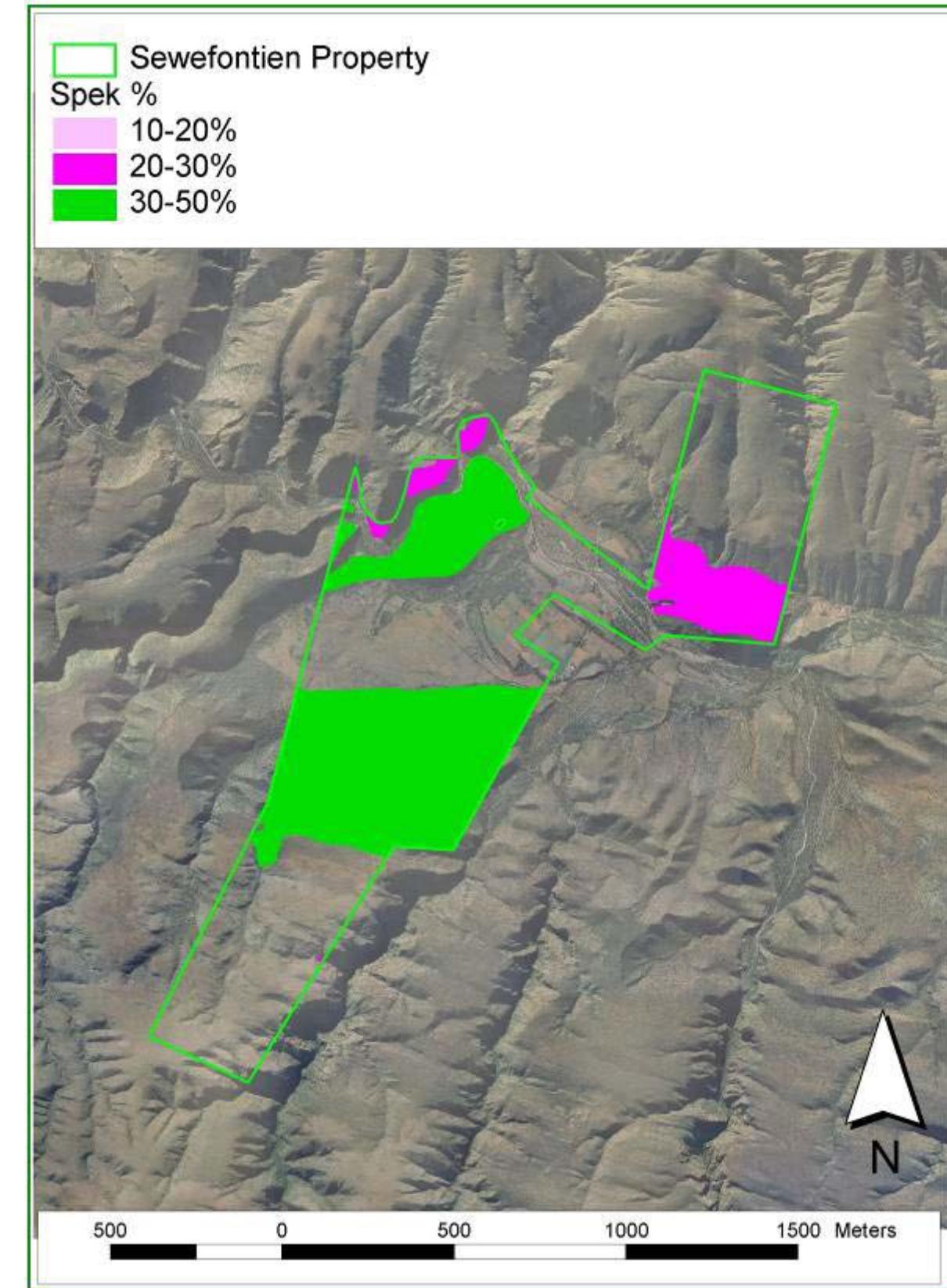
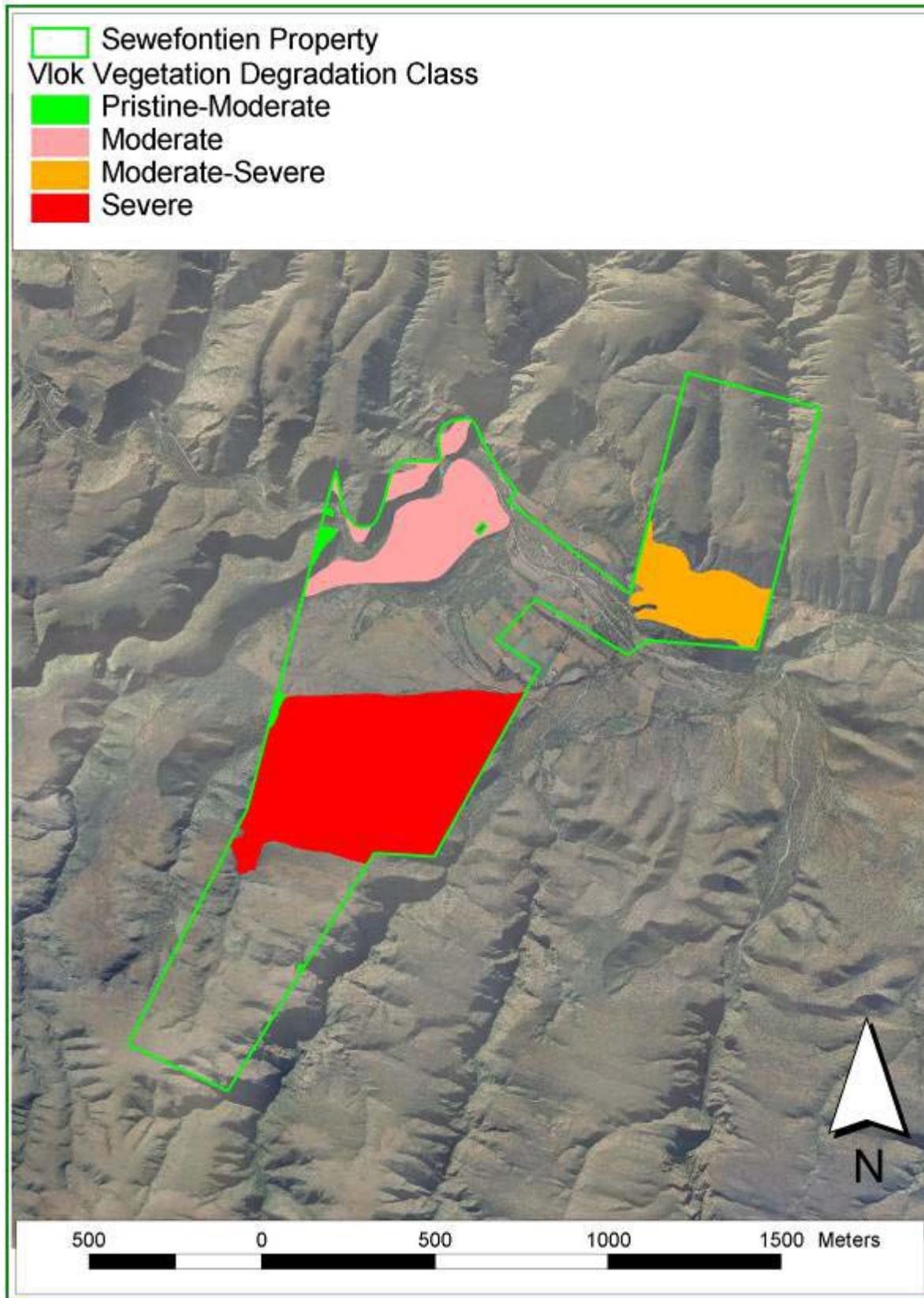
Appendix 18. Vegetation and degradation data for the Reyneke Property (Vlok 2010).



Appendix 19. Vegetation and degradation data for the Rooikloof Property (Vlok 2010).

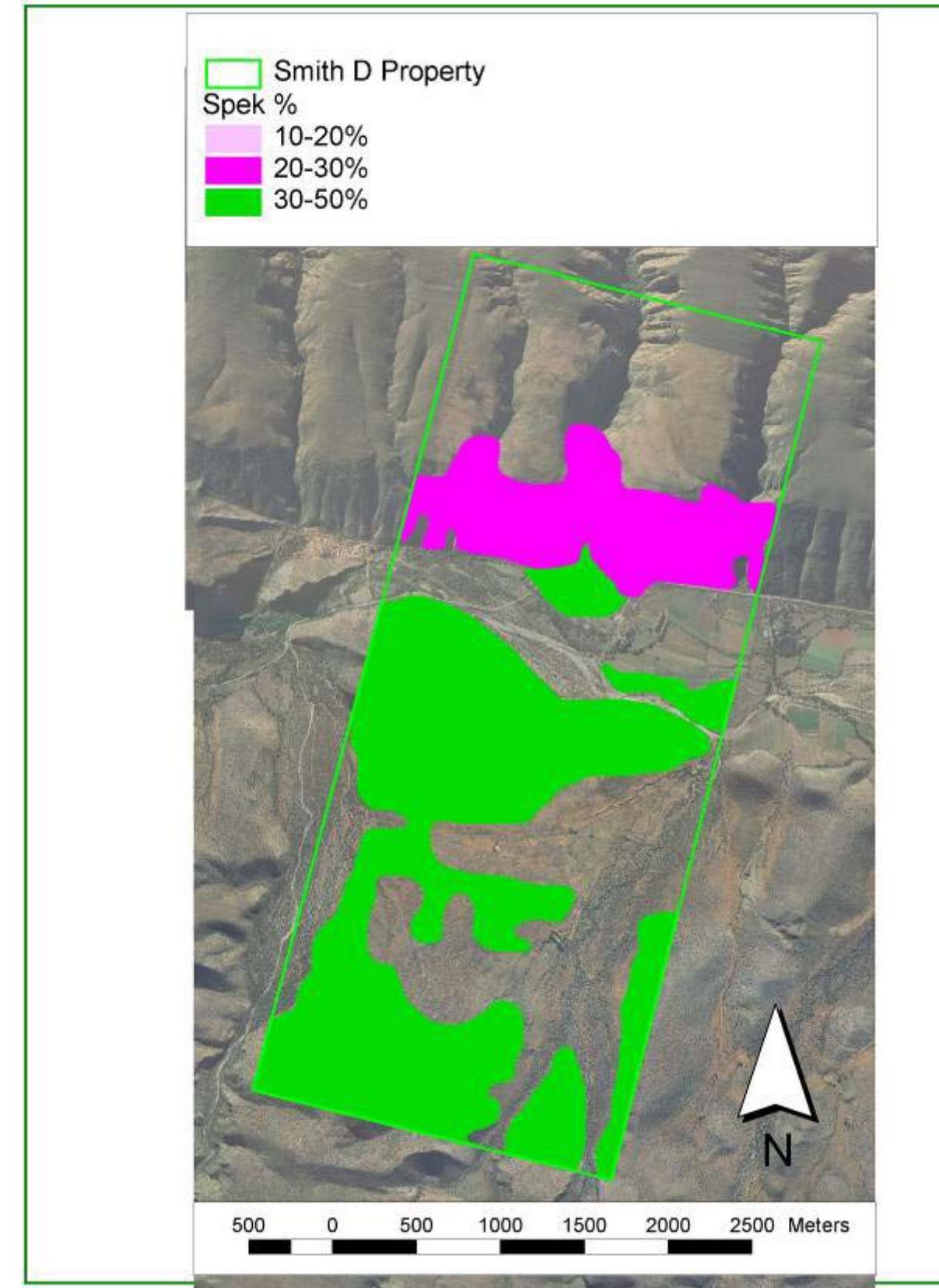
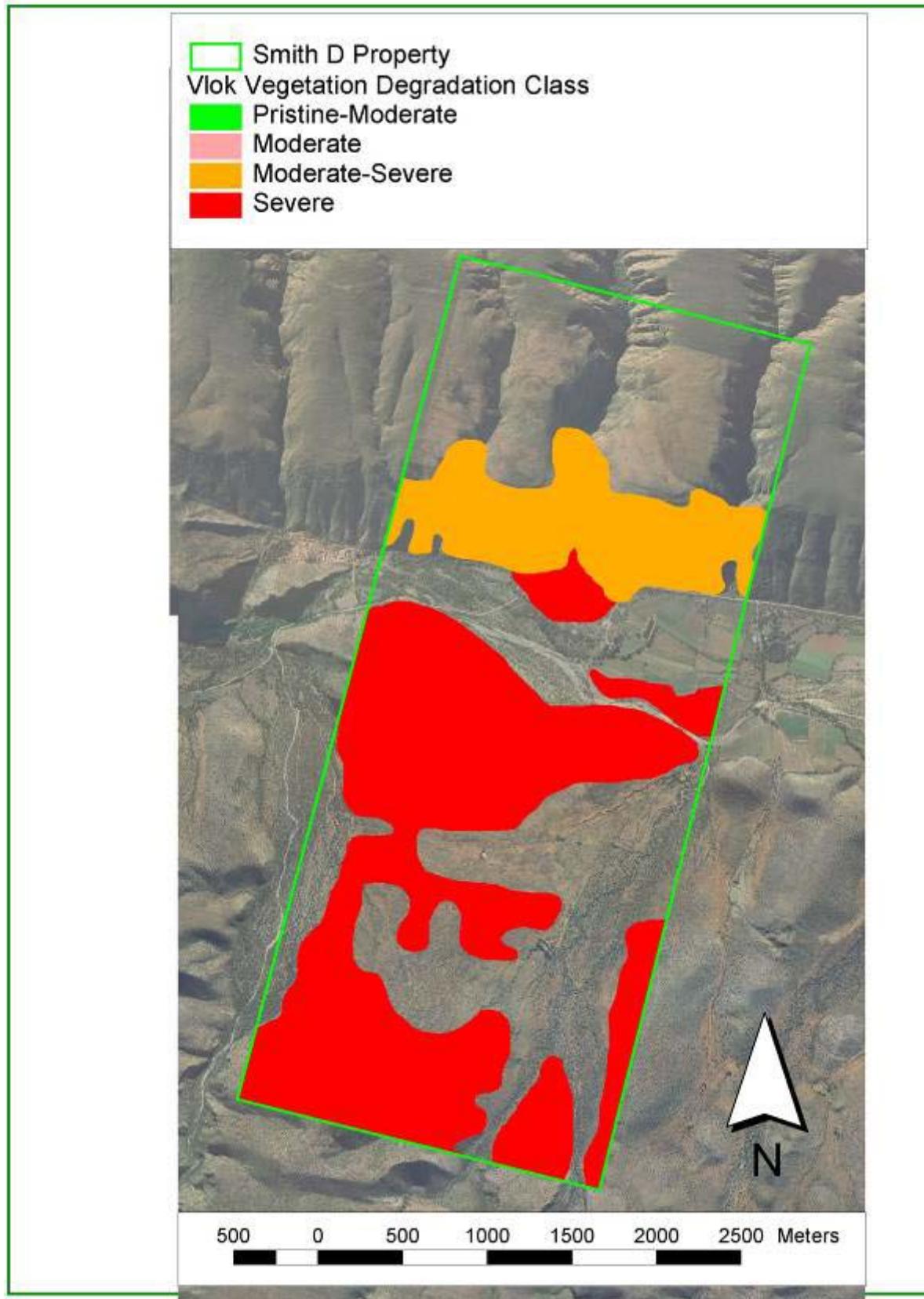


Appendix 20. Vegetation and degradation data for the Sewefontein Property (Vlok 2010).

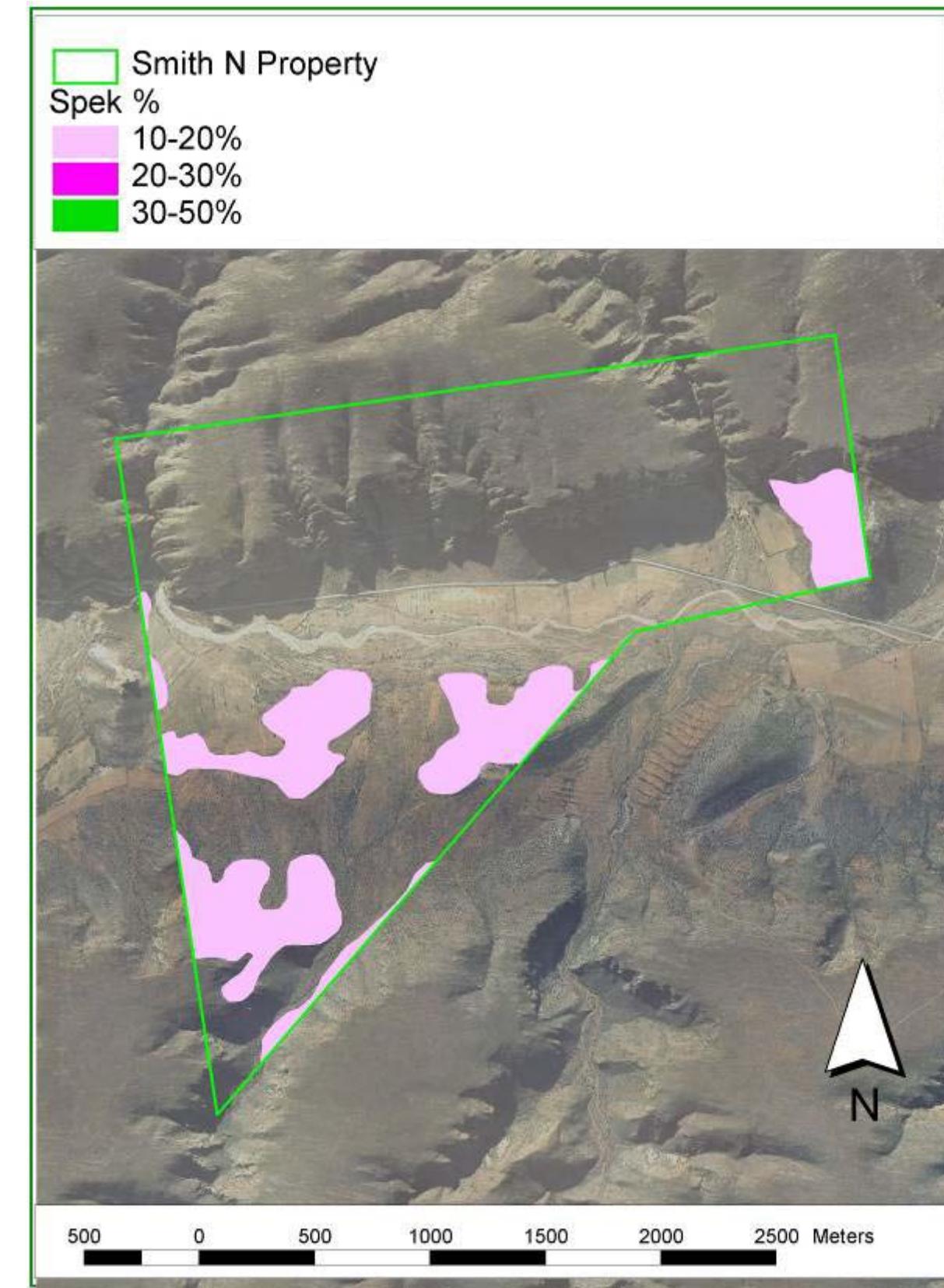
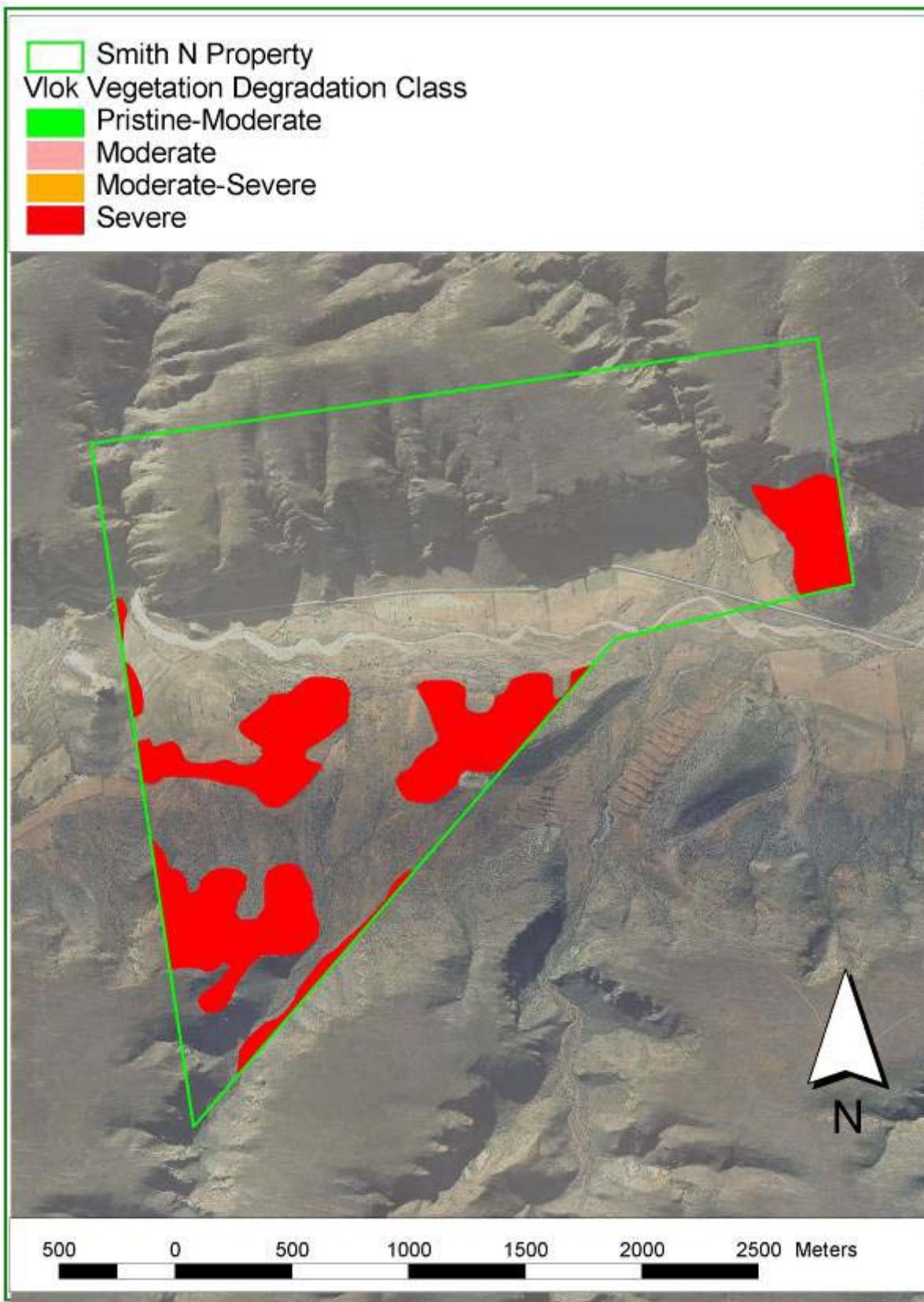


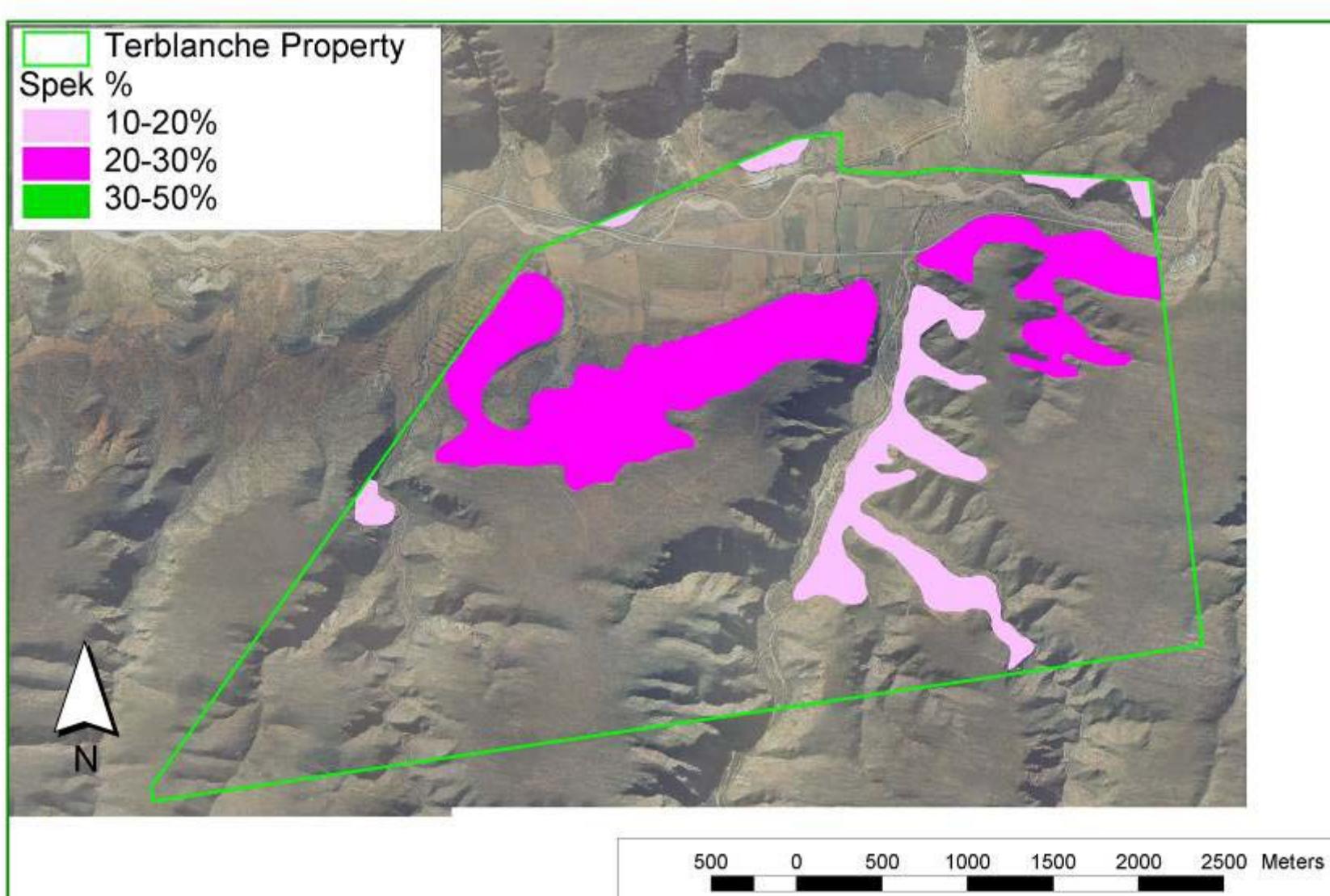
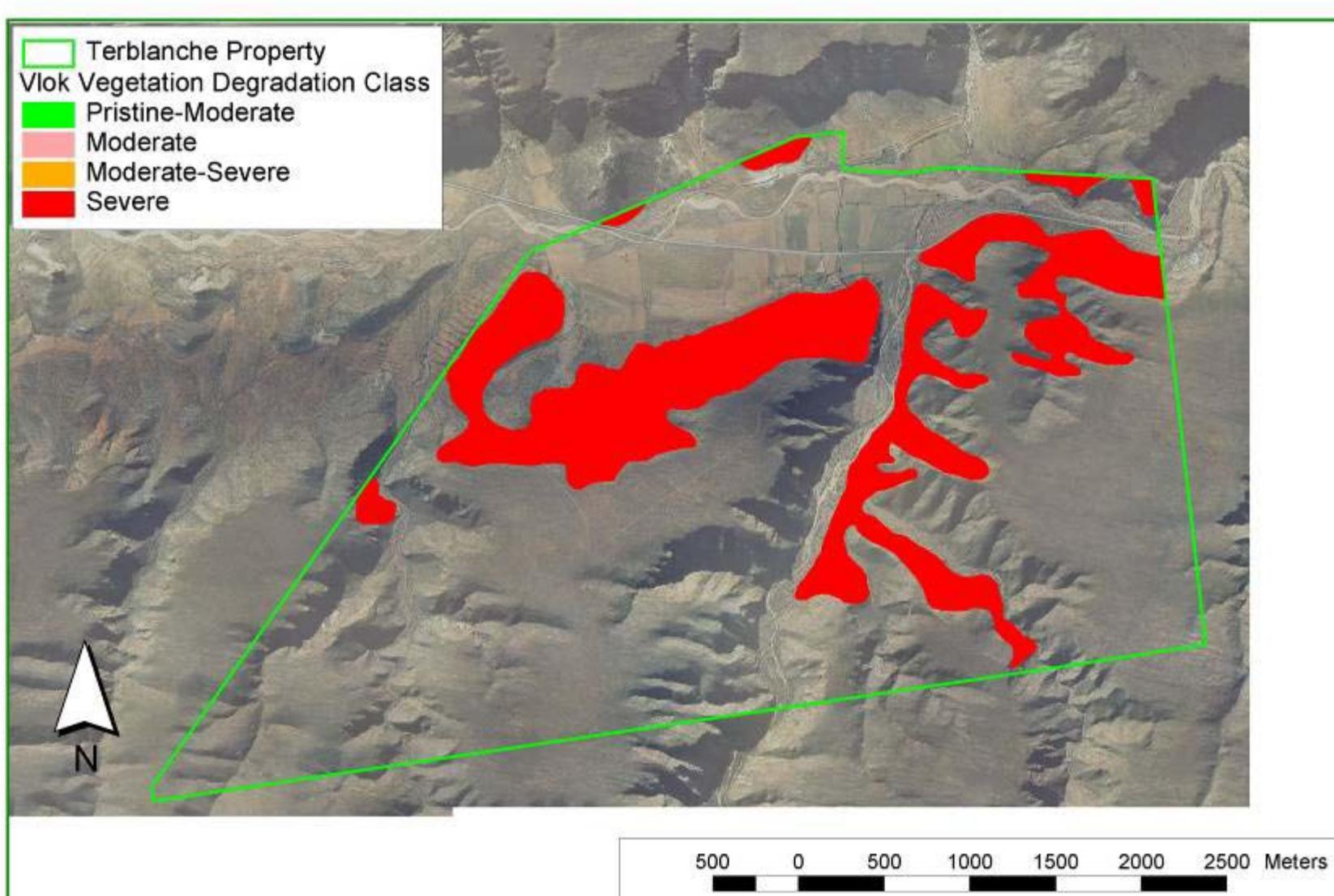


Appendix 21. Vegetation and degradation data for the Smith D Property (Vlok 2010).

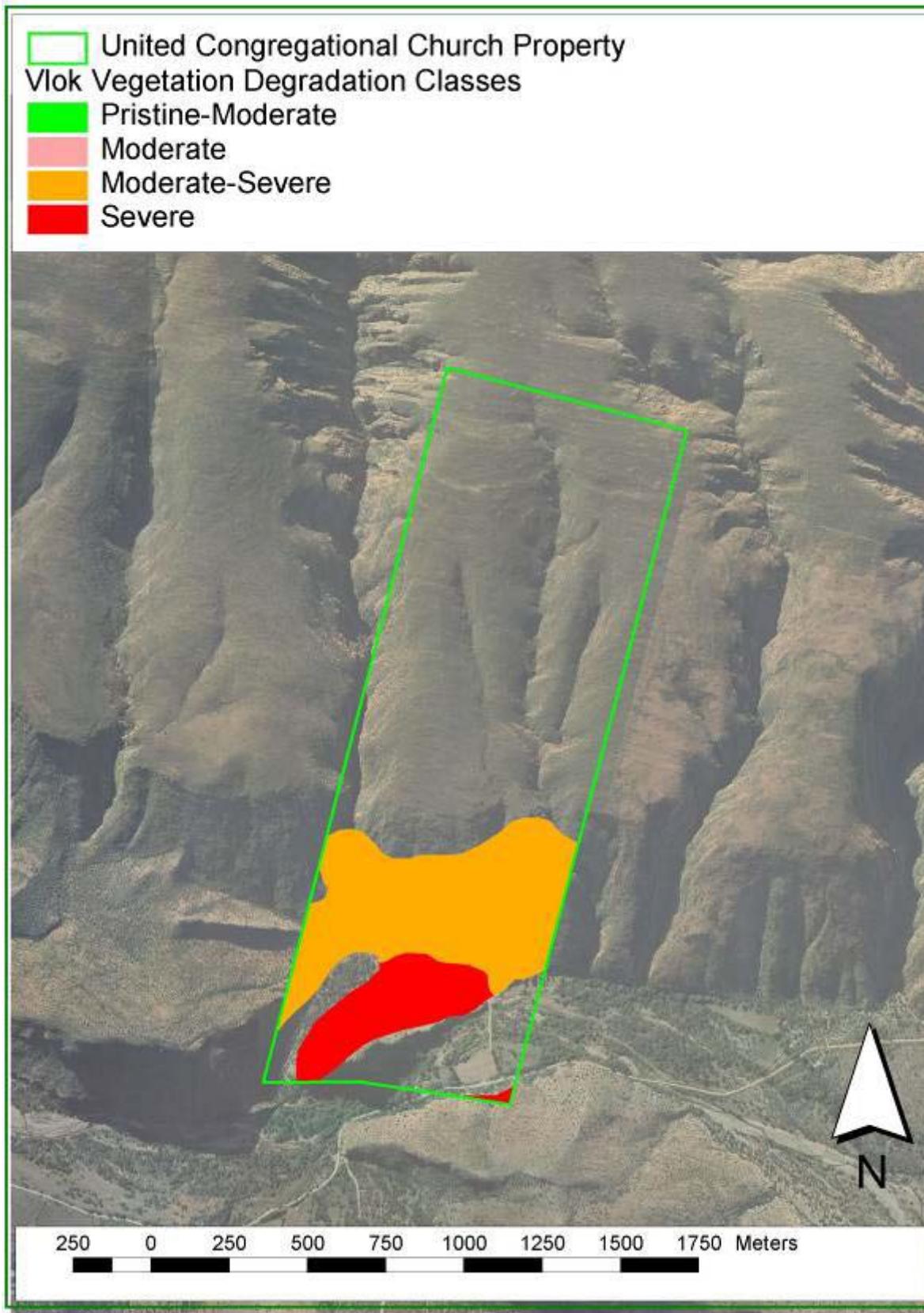


Appendix 22. Vegetation and degradation data for the Smith N ([Vlok 2010](#)).

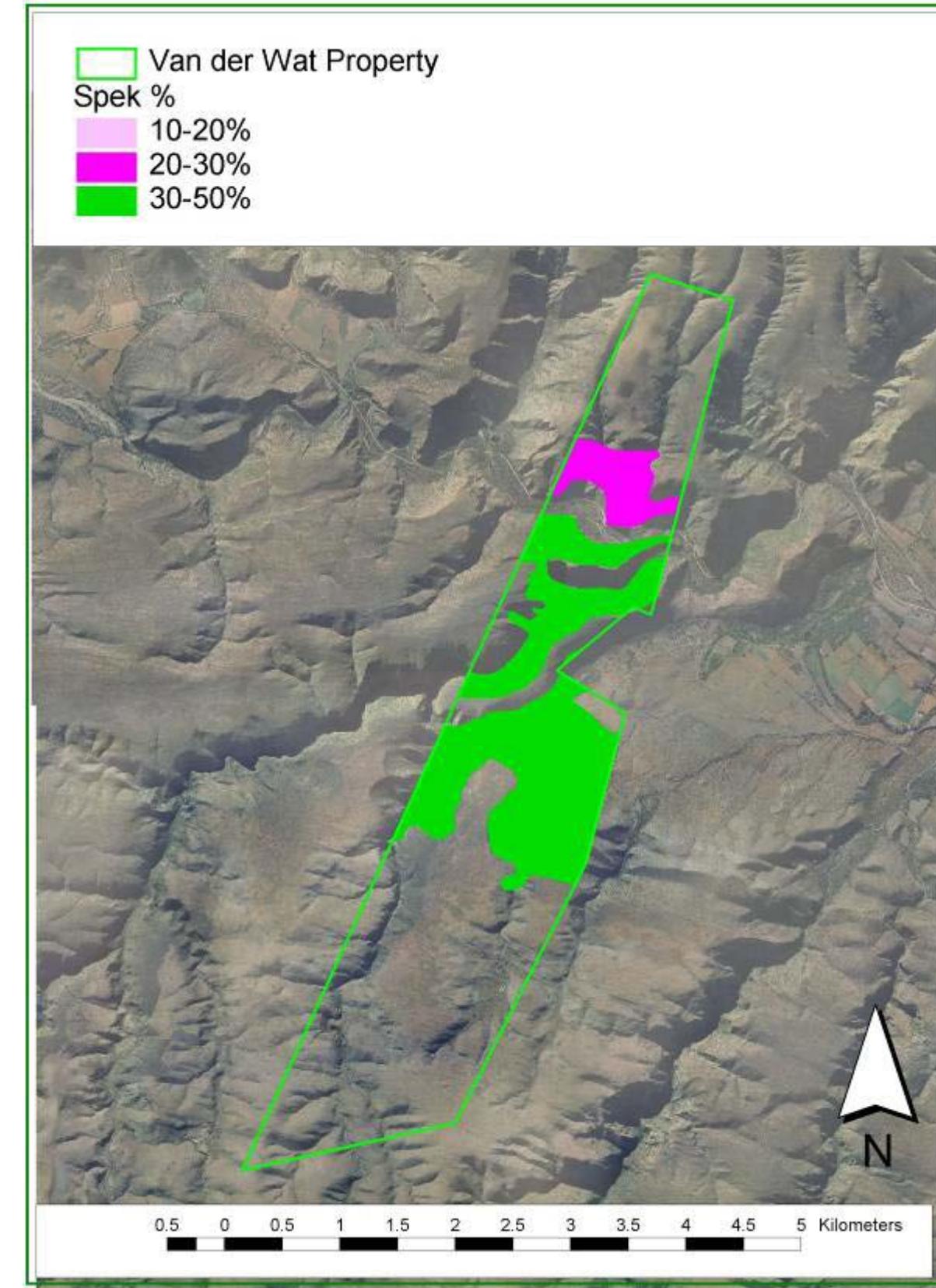
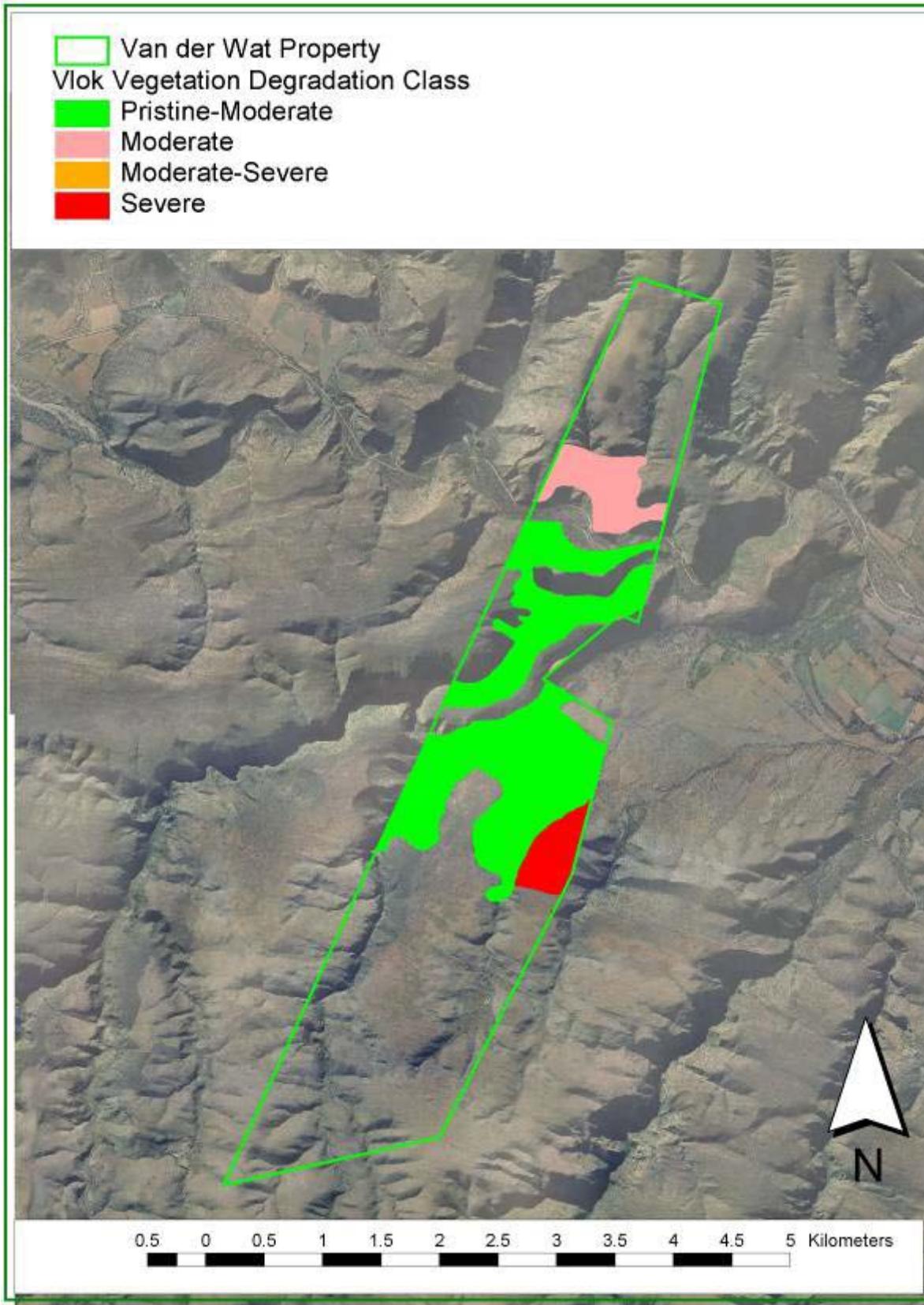


Appendix 23. Vegetation and degradation data for the Terblanche Property ([Vlok 2010](#)).

Appendix 24. Vegetation and degradation data for the United Congregational Church Property (Vlok 2010).



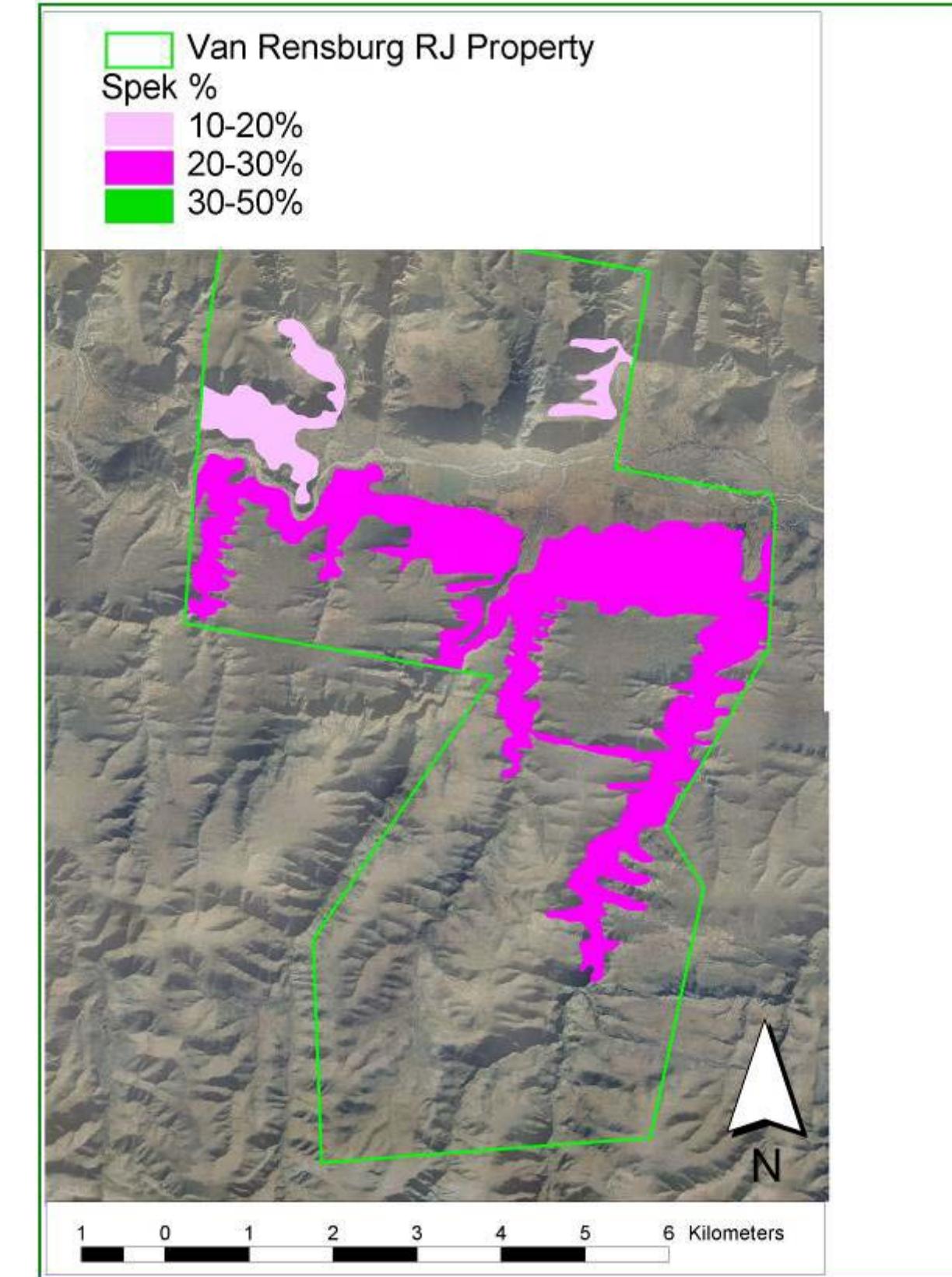
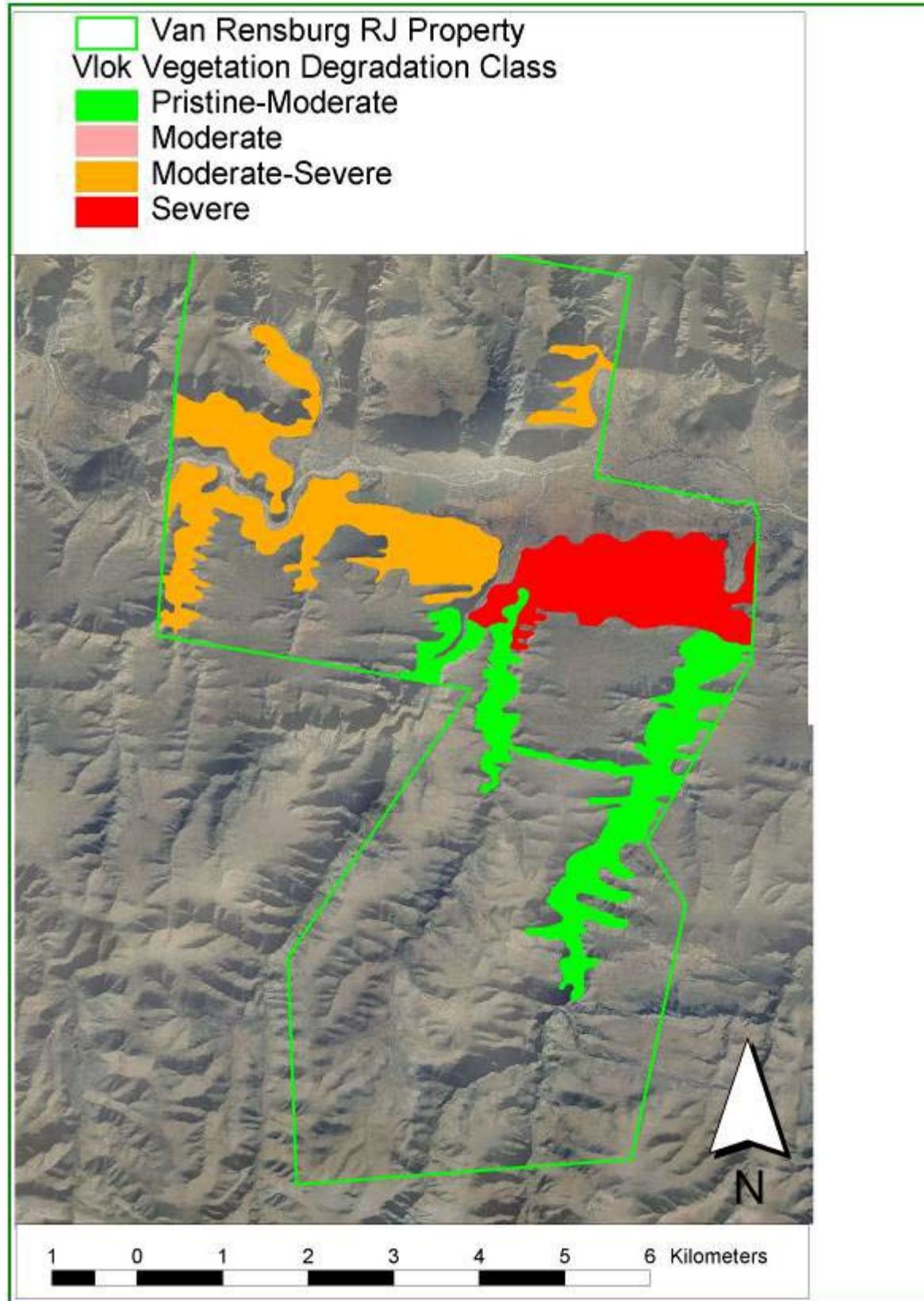
Appendix 25. Vegetation and degradation data for the Van de Wat Property (Vlok 2010).



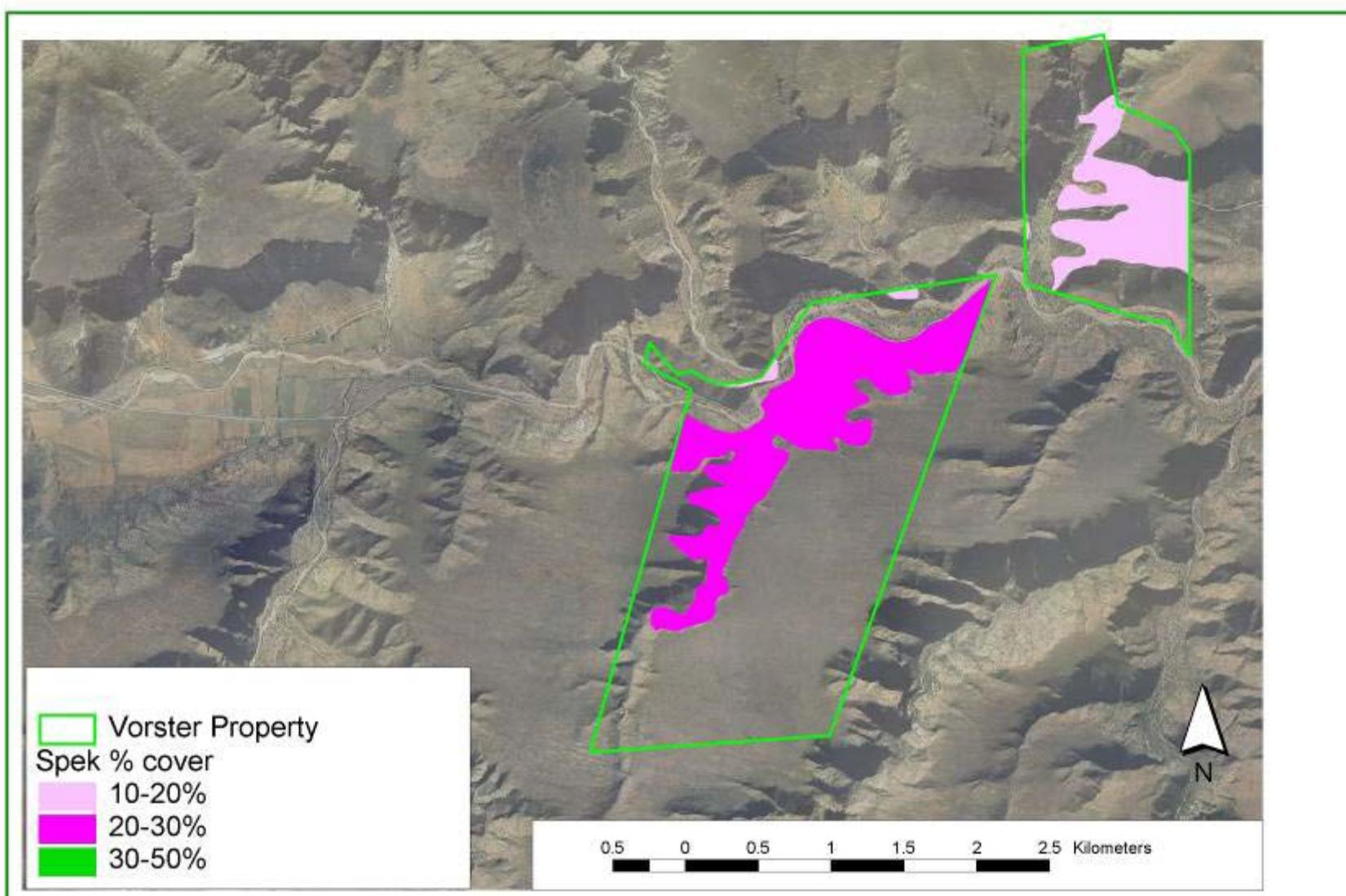
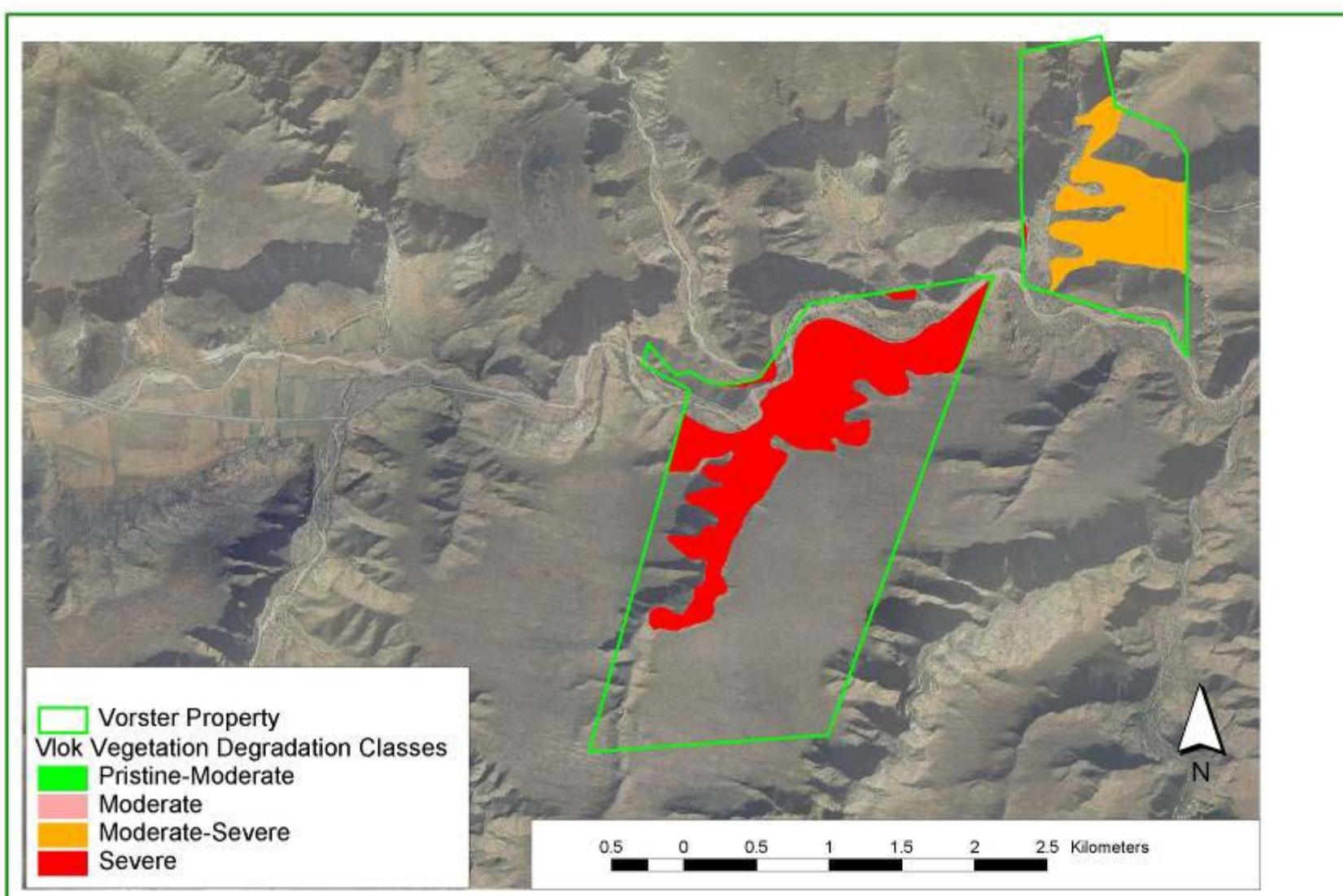
Appendix 26. Vegetation and degradation data for the Van Rensburg MG Property (Vlok 2010).



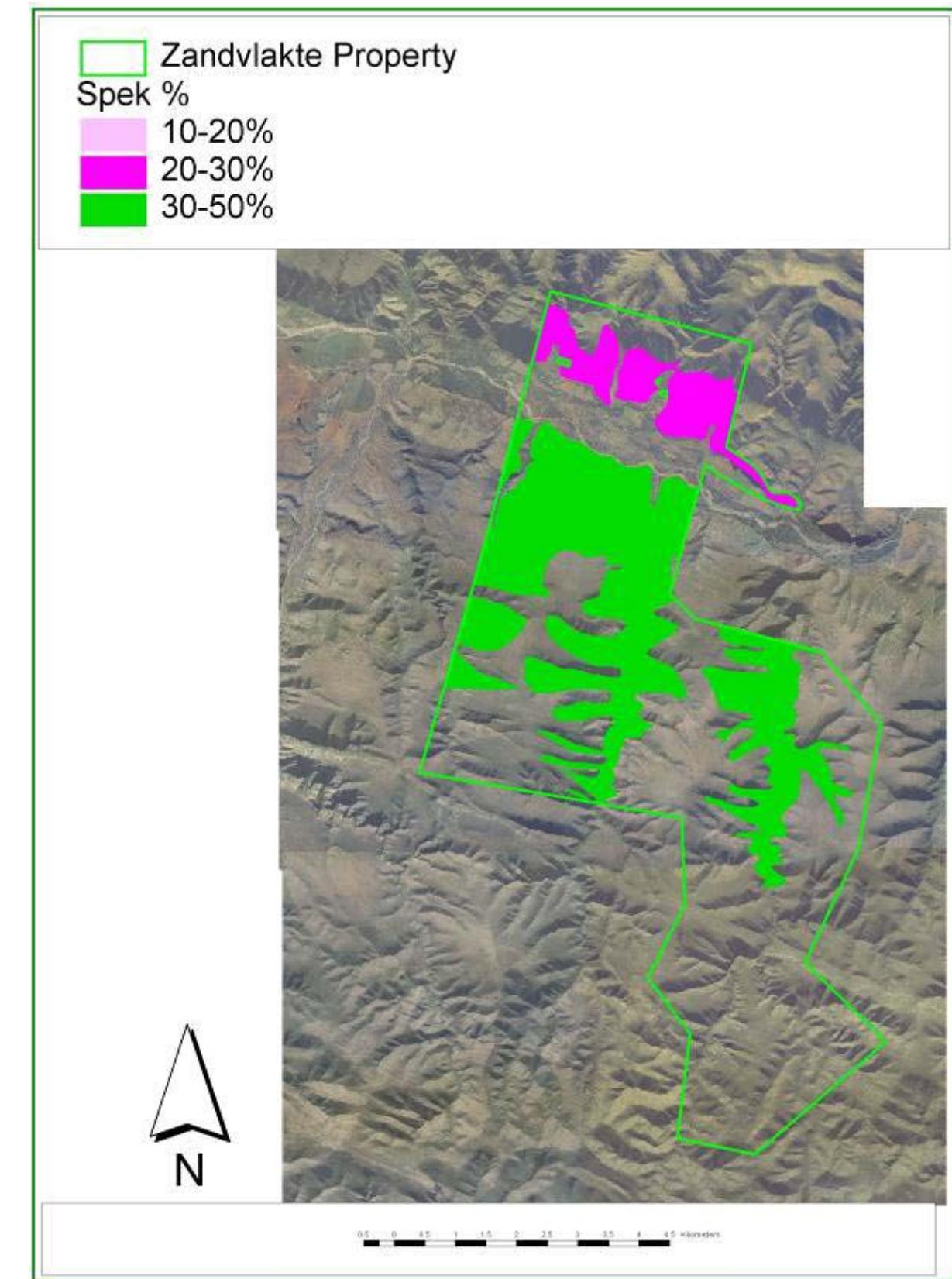
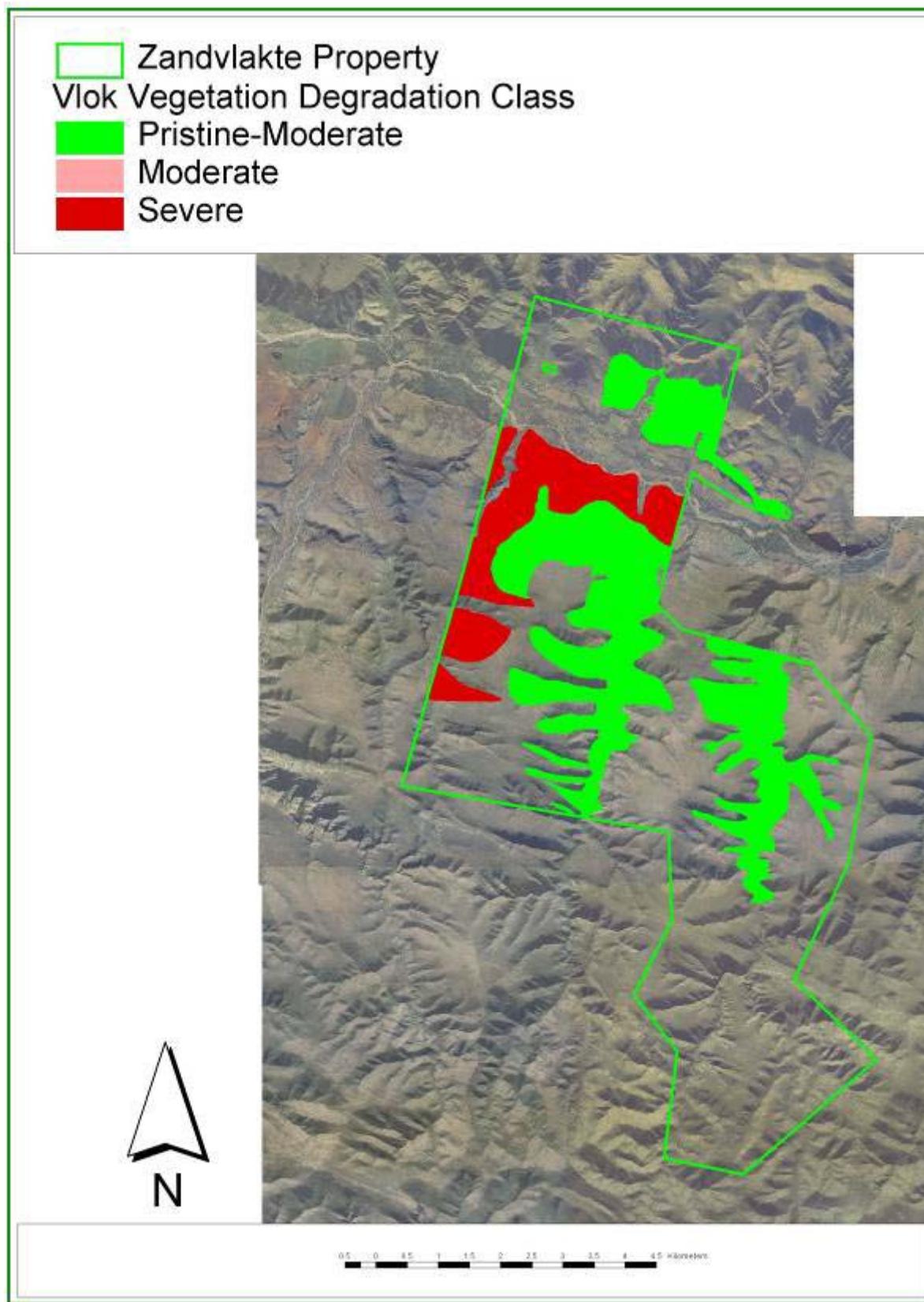
Appendix 27. Vegetation and degradation data for the Van Rensburg RJ Property (Vlok 2010).



Appendix 28. Vegetation and degradation data for the Vorster Property (Vlok 2010).



Appendix 29. Vegetation and degradation data for the Zandvlakte Boerdery Trust Property (Vlok 2010).



Appendix 32.

Western Baviaanskloof Private Lands
Landuse change, restoration and carbon farming
Concept Note
26 May 2010
Draft 1
Mike Powell – Rhodes Restoration Research Group
Vision

To reach a stage where all land use in the Baviaanskloof catchments (L81A-D), can be certified as being truly sustainable and socially equitable, with a net increase in the quality of life for all residents.

Focus Area

This proposal seeks to outline a strategy and plan for the area that encompasses the entire catchment of the Baviaanskloof River - see appendix A. The proposal looks to bundle the section of the Baviaanskloof Nature Reserve (highlighted green) with the 20+ private and communal landowners in the western Baviaanskloof catchment – in the context of a Payment for Ecosystem Services **IMPLEMENTATION PLAN**.

Background

The Western part of the Baviaanskloof (as described above) has unfortunately experienced excessive degradation from previous unsustainable land use practices – See appendix B. The law of diminishing returns, coupled with rising fuel costs and global climate change are collectively going to make it highly unlikely for commercial farming to persist (especially sustainably) for much longer. Vast tracts of vegetation have been severely degraded and this has resulted in very poor carrying capacities, as well as extremely unpleasant aesthetics. Degradation is not sexy and cannot be marketed well, the tourists are well-informed.

The Baviaanskloof has become extremely well branded over the last five years and tourism has increased considerably. Many landowners have started small to medium eco-tourism operations, but many still cannot make the transition from agriculture. Tourism development in the community areas has received scant attention and the communities have benefited disproportionately. Despite the investment into the area, and substantial marketing there exists a very fragmented approach to the tourism and economic development of the area. Collective branding and group marketing is required.

The Department of Water Affairs initiated the Subtropical Thicket Restoration Plan in 2004, with a view to building a platform, and a scientific/business case for a Payment for Ecosystem Services in the Baviaanskloof (carbon credits being the key focus). In 2010 a feasibility study was completed for the Baviaanskloof, Kouga, Kromme and Tsitsikamma areas. The work and collaboration of a host of parties and role-players has finally allowed for the implementation of a PES project.

An urgent need exists to demonstrate to the communities that concrete and tangible benefits can be accrued from sustainable land use practices.

Rationale

A rare opportunity has presented itself. The work of the PRESENCE network and the ECParks has greatly increased the credibility of conservation-orientated initiatives in the area. Farmers are willing to consider real collaboration. The growth of the carbon economy and the work of Department of Water Affairs and the Gamtoos Irrigation Board has made “carbon

farming” a real option. The income from carbon farming (probably through land rentals) may provide the bridging financing needed for farmers to fully develop the eco-tourism in the Baviaanskloof River Valley.

A large-scale change from commercial agriculture to eco-tourism, game farming and carbon farming requires the collective pooling of the EGS into a trust from which equitable benefits can be derived – based on pro-rata basis (hectares of land signed into stewardship for example). “***Sustainable Land Use – Intergenerational Equity***” should be our mantra.

Should the various role-players in the project team able to pool resources and agree on a common vision, it provides CONSERVATION with some leverage to effect change in some land use and social practices (fire, water abstraction, recycling, stock reduction, restoration, social equity). The secret is in the deal making and finding the “tipping points” to make the land use changes.

Go-forward Plan

- An in principle agreement is needed from ECParks regarding the willingness to contribute as much as possible in the form of incentives. A quantification of these incentives is required to enable to compilation of a business plan and suite of landowner agreements.
- A rapid “willingness assessment” of landowners is needed to test the appetite for landowners to embark on such a long-term venture.
- A rapid mini-feasibility assessment is needed to quantify the “sellable” EGS on a property by property basis. An institutional assessment and legal-framework is required to incorporate the social equity (community trust and pooled EGS).
- A suite of contractual arrangements (business deals) are compiled and presented to land-owners.
- The project team (assuming 50%+ of landowners commit) seeks co-funding (WfWater, WfWoodlands, WfWetlands, DBSA, ECDevCorp, Nelson Mandela Metro and carbon markets).

Possible Project Implementation Team

Living Lands – Dieter van Den Broeck, Marijn Zwinkels

Rhodes Restoration Research Group – Mike Powell

Nollen Group South Africa – Hy Martin, Mike Powell

Eastern Cape Parks - Tracey Steyn

(Possibly Myles Mander and Future Works, James Blignaut????)

Eastern Cape Parks Commitments

- All EGS accrued for the BNR area shaded green in appendix 1, would be considered as “sweetner” to inducing land use change for ALL landowners in the project area. Clear “EGS quantification boundaries” and “EGS harvesting boundaries” need to be established. Bundling EGS and linking to the ring-fence community is key.

- All fiscal incentives from the newly launched ECParks Stewardship Programme would be included in the overall deal. The art of deal-making is required.
- The movement of large and charismatic game (rhino, buffalo, mountain zebra etc.) would be unrestricted and numbers would be increased where feasible.
- Marketing and branding for the Collective Contractual Park to benefit all the landowners.

Conclusion

There is a real possibility that in a very short space of time, the Western Baviaanskloof (i.e. the Baviaanskloof Catchment could become the prime tourist destination in the Eastern Cape, while at the same time providing a net increase in the quality of life for ALL residents and landowners. The combination of staggering scenery, vast open expanses of true wilderness, truly hospitable people and the prospect of free ranging and charismatic large game in a contiguous band from Rooihoek to Nuwekloof (~ 125 000 hectares). The visual enhancement of the landscape through the reduction of fences, irrigation equipment and unsightly human artefacts will vastly improve the marketability of the Collective Contractual Park. A very sexy name/branding think tank is required to encapsulate the full magic of this “crater-like” or “Great Rift Valley-like” situation where a special lost world exists where people have changed the way they do things and have fenced themselves in and given nature free reign.

Catchments
EC Parks Core
Nature Reserve Border
Private Properties
BIDULPH
CONGREGATIONAL CHURCH - WILLOWMORE
CREATIVE FUTURES COMMUNITY TRUST
CREAM WORLD INC 127 PTY LTD
DU PREEZ
DU PREEZ FAMILY TRUST
EDUCATIONAL TRUSTEES
ERIEE TRUST
HONEY
INITIATIVE S A INV 71 PTY LTD
LAMPRECHT - TRUSTEES
LEZMIN 2007 C C
NED GER KERK - WILLOWMORE
NORTJE
NOT IN DEEDSWEB
REYNKE
ROOKLOOF C C
RSA
SEWFONTEIN GEMEENSKAPSBOERDERY TRUST
SITH
TERPANCHE
UNITED CONGREGATIONAL CHURCH OF SOUTH A
VAN DER WAT
VAN RENSBURG
VORSTER
ZANDVLAKE BOERDERY TRUST

