TEMPERATE INDIGENOUS GRASSLAND GAINS IN SOUTH AFRICA: LESSONS BEING LEARNED IN A DEVELOPING COUNTRY

Clinton Carbutt*[1] and Greg Martindale[1]

* Corresponding author: Clinton.Carbutt@kznwildlife.com
[1] Ezemvelo KwaZulu-Natal Wildlife, PO Box 13053, Cascades, 3202, South Africa

ABSTRACT

The fragile state of temperate indigenous grasslands globally has galvanised action in the form of the Temperate Grasslands Conservation Initiative of the International Union for Conservation of Nature's World Commission on Protected Areas. However, despite this initiative raising the profile of temperate grassland conservation on the global conservation agenda, one still requires country-based interventions at the hands of local conservation authorities, in collaboration with non-governmental organisations (NGOs), to improve protection levels on the ground. To this end we report on progress made with temperate indigenous grassland conservation in South Africa since 2006, a landmark heralding the birth of biodiversity stewardship in our temperate grassland biome. Since then an additional 124,983 ha of temperate grassland have been brought under formal protection with a further 96,641 ha in the declaration process, most of which should be secured by the end of 2014. We also discuss the driving forces underpinning these gains - namely the National Protected Area Expansion Strategy, the Grasslands Programme of the South African National Biodiversity Institute, provincial biodiversity stewardship units and funding channelled through the Critical Ecosystems Partnership Fund into civil society to augment the state's contribution. Given the clear benefits derived from each intervention, we encourage other relevant countries with temperate indigenous grasslands to develop similar structures in the quest to safeguard representative, viable samples of one of the world's great terrestrial biomes.

KEYWORDS: temperate indigenous grasslands, South Africa, biodiversity stewardship, protected areas

INTRODUCTION

Temperate indigenous grassland conservation has over the years languished behind conservation efforts directed towards the more charismatic tropical grasslands and tree-dominated biomes. For example, Henwood (1998a) and Bertzky et al. (2012) reported that biomes such as savannas, sub-tropical and tropical forests, and mangroves have all been afforded far higher levels of protection than temperate indigenous grasslands. The reason is partly accounted for by the 'tragedy of the commons' example: the once widespread yet highly amenable indigenous grasslands have been largely transformed into production landscapes (Henwood, 1998b; Henwood, 2010). Sadly, congruence with areas of rich mineral and agricultural resources has led to irreversible land-use change at the hands of development and intensive resource use, with far less secured through the more measured and compatible forms of land-use management such as conservation and sustainable resource use. It appears that a tipping point has now been reached whereby temperate grasslands in many parts of the world have been reduced to vestiges of their former ecological state (Henwood, 1998b; Henwood, 2006; Peart, 2008a). The most imperilled and least protected terrestrial biome on the planet (Henwood, 1998b; Mark & McLennan, 2005; Henwood, 2009; Henwood, 2010) requires a Herculean effort to stem further habitat loss and bring representative samples of temperate vegetation and ancillary biodiversity under formal conservation.

An estimated 3.4 per cent to 5.5 per cent of the world's temperate grassland biome is protected (Peart, 2008b; Bertzky et al., 2012). The aim is to double this level of protection (to 10 per cent) by 2014 (TGCI, 2011), a milestone still well below Aichi Biodiversity Target 11, namely 17 per cent protection of all terrestrial ecosystems by 2020, set in 2010 during the 10th Conference of the

Table 1: Countries contributing the most temperate indigenous grassland in southern Africa (ranked from largest to smallest contributor by area) and the breakdown of support for the Biodiversity Stewardship Programme (BSP) and protected area expansion strategies (PAES)

Countries, and provinces in South Africa, with TGB	Area of countries, and provinces in South Africa, with TGB (km^2 and %)	Has a PAES in place?	Has a BSP unit?	Size of BSP unit
Free State (South Africa)	112,348 (31.20)	in progress	yes (2012)	2 (1 manager/ 1 part-time facilitator)
Eastern Cape (South Africa)	67,181 (18.65)	yes (2012)	yes (2012)	1 (1 manager)
Mpumalanga (South Africa)	50,977 (14.15)	yes (2009)	yes (2009)	2 (1 manager; 1 facilitator)
KwaZulu-Natal (South Africa)	44,861 (12.46)	yes (2010)	yes (2006)	5 (1 manager; 4 facilitators)
North West (South Africa)	32,281 (8.96)	yes (2013)	yes (2013)	3 (1 manager; 2 facilitators - vacant)
Lesotho	30,538 (8.48)	no expansion strategy or BSP		
Gauteng (South Africa)	11,697 (3.25)	yes (2011)	yes (2009)	5 (2 managers; 3 facilitators)
Swaziland	4259 (1.18)	no expansion strategy or BSP		
Northern Cape (South Africa)	3724 (1.03)	not applicable (small outlying fragments only; not considered further)		
Limpopo (South Africa)	2157 (0.60)	not applicable (small outlying fragments only; not considered further)		
Western Cape (South Africa)	126 (0.04)	not applicable (extremely small outlying fragments only; not considered further)		
Total (km^2)	**360,149**			

Notes: The size of the BSP unit excludes secretarial support. The South African contribution is ranked by province. TGB: temperate grassland biome

Parties to the Convention on Biological Diversity in Nagoya, Japan (CBD, 2012). Temperate indigenous grassland conservation is slowly gaining momentum thanks largely to the Temperate Grasslands Conservation Initiative (TGCI), launched officially in 2008 at the Joint International Grasslands-Rangelands Congress hosted in Hohhot, China (Peart, 2008b; Henwood, 2009; Henwood, 2010; Mark, 2012). The primary target or focal areas for temperate indigenous grassland conservation are understandably the world's remaining large contiguous and intact tracts of grassland that support landscape-scale processes (Peart, 2008b; TGCI, 2010a), and that once secured will afford the most cost effective returns on expended effort. These grasslands are located in the Patagonian Steppe (Argentina and Chile), Daurian Steppe (Russia, Mongolia and China), Kazakh Steppe (Kazakhstan) and the Northern Great Plains (Canada and USA) (Peart, 2008b; TGCI, 2010a; Mark, 2012). These four mega-regions may potentially contribute millions of hectares and are therefore the most realistic means of achieving the 10 per cent protection target.

Although the TGCI has successfully highlighted the plight of temperate grasslands at a global scale (Peart, 2008a), and placed them on the global conservation agenda (Peart, 2008b; TGCI, 2010b; TGCI, 2012), it is still incumbent upon country-based interventions at the hands of local conservation authorities in collaboration with NGOs, to secure adequate representation of these grasslands on the ground.

TEMPERATE INDIGENOUS GRASSLANDS IN SOUTHERN AFRICA

Notwithstanding the significant extent of transformation, the grassland biome of southern Africa is essentially a semi-contiguous expanse of temperate indigenous grassland with small outlying biome fragments located north and south-west of the biome core. This temperate grassland biome (TGB) comprises the sub-escarpment, escarpment and plateau grasslands and shrublands associated with the Great Escarpment that formed during a period of dramatic continental uplift of the subcontinent during the Pliocene (Mucina & Rutherford,

The Maloti Drakensberg Transfrontier World Heritage Site is Southern Africa's largest temperate indigenous grassland protected area, covering an area of *c.* 250,000 ha. It is due to be expanded by a further 44,500 ha thanks to the pending declaration of the proposed Upper uThukela Nature Reserve © Clinton Carbutt

2006). In South Africa, six provinces, namely Free State, Eastern Cape, Mpumalanga, KwaZulu-Natal, North-West and Gauteng, account for most of South Africa's temperate indigenous grasslands (Table 1). The remaining three provinces contribute only extremely small outlying grassland fragments, particularly Western Cape (Table 1).

The National Biodiversity Assessment 2011, a national assessment of the state of South Africa's biodiversity and ecosystems, has identified the TGB as one of the most threatened and least protected biomes in South Africa (Driver et al., 2012). Only some 2 per cent of the TGB is formally conserved in South Africa (Carbutt et al., 2011), with one of the four grassland bioregions, namely the sub-escarpment grassland bioregion, requiring 'critically important' attention (SANBI & DEAT, 2008). The corollary is that 98 per cent of the TGB is unprotected, and when one factors in that at least 33 per cent is already irreversibly transformed (Carbutt et al., 2011), then 65 per cent of South Africa's temperate indigenous grasslands remain in varying degrees of degradation, fragmentation and semi-intensive to intensive use on private and communal land. The principal transformer of the TGB in South Africa is cultivation (Reyers et al., 2005). Therefore of the total area of *c.* 360,149 km² delineated by Mucina & Rutherford (2006; Table 1), only a much smaller proportion is potentially available to the conservation estate. For this reason the global framework of expansion potential for temperate grassland landscapes has categorized South Africa as a 'moderately modified and fragmented landscape' (UNEP -WCMC, 2008). Expansion opportunities in South Africa at scale are relatively limited, and any gains that may be achieved at the landscape-scale will be the exception.

South Africa is obligated to protect its temperate indigenous grasslands, firstly as a signatory to the Convention on Biological Diversity, and more specifically as a signatory to the Hohhot (Peart, 2008b) and Bariloche (TGCI, 2010a) Temperate Grasslands Declarations (signed June 2008 and February 2010, respectively). To this end we focus on the progress with temperate indigenous grassland conservation in South Africa. The aims of this paper are twofold: (1) document the gains achieved for temperate grassland conservation since the baseline assessment of Carbutt et al. (2011); and (2) share some of the key initiatives that have underpinned these gains.

Although the focus of this study is South Africa, all of the land-locked mountain kingdom of Lesotho, as well as the western highlands of Swaziland, also form part of this TGB (Table 1). An exciting recent development is the inclusion of Sehlabathebe National Park in Lesotho as an extension of the uKhahlamba Drakensberg Park World Heritage Site in South Africa, which is being renamed the Maloti Drakensberg Transfrontier World Heritage Site. This inclusion opens the door to further additions within Lesotho and to an extension of the formally delineated and appropriately managed buffer zone around the uKhahlamba Drakensberg Park World Heritage Site into Lesotho.

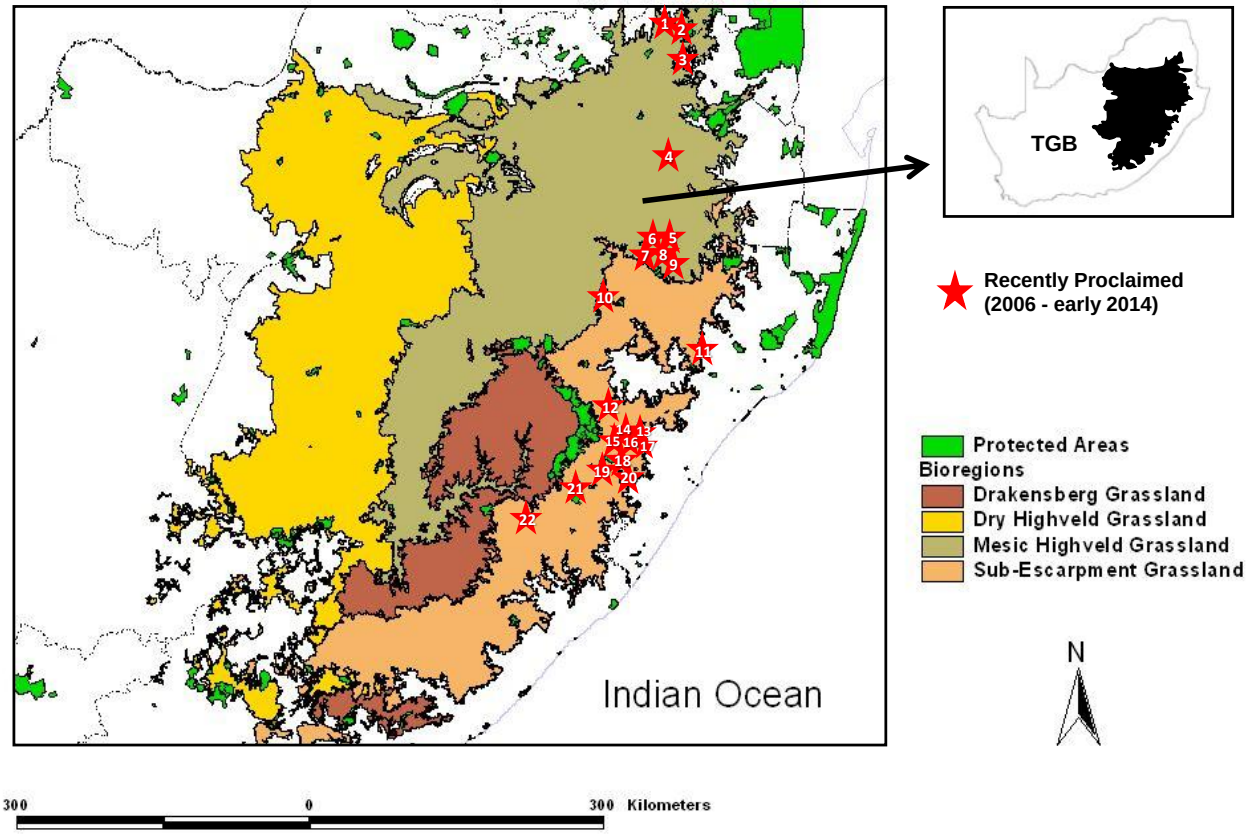

Figure 1: Map of the Temperate Grassland Biome (TGB) in South Africa, Lesotho and Swaziland, showing the four grassland bioregions, and the most recently declared temperate indigenous grassland protected areas (shown as red stars) relative to the protected area network pre-2006 (shown in green). Adapted from Carbutt et al. (2011) using the bioregion delineation of Mucina & Rutherford (2006)

Key to recently declared temperate indigenous grassland protected areas listed from north to south: 1. Kudu Private Nature Reserve; 2. Mndawe Trust Protected Environment; 3. Buffelskloof Private Nature Reserve; 4. Chrissiesmeer Protected Environment; 5. KwaMandlangampisi Protected Environment; 6. KwaMandlangampisi Protected Environment (expansion); 7. Tafelkop Protected Environment; 8. Mabola Protected Environment; 9. Pongola Bush Protected Environment; 10. Ncandu Private Forest and Grassland Reserve; 11. Gelijkwater Misbelt Nature Reserve; 12. Zulu Waters Game Reserve; 13. Mt Gilboa Nature Reserve, and the two properties in close proximity, Dartmoor and Middle Drai (the latter two properties form part of Karkloof Nature Reserve); 14. Blue Crane Nature Reserve; 15. Bill Barnes Crane and Oribi Nature Reserve; 16. Michaelhouse Nature Reserve; 17. Hilton College Nature Reserve; 18. Mount Shannon Protected Environment; 19. Clairmont Nature Reserve; 20. Roselands Nature Reserve; 21. Excelsior Protected Environment; 22. Matatiele Nature Reserve

METHODOLOGY

This study focuses only on the temperate indigenous grasslands of South Africa, since Lesotho and Swaziland do not have any formal programmes dealing with temperate indigenous grassland conservation and reporting. All South African protected areas in the TGB formally declared (proclaimed) since 2006 as either nature reserves or protected environments were identified and documented as the recent gains for temperate grassland conservation. The year 2006 was selected because the baseline assessment of Carbutt et al. (2011), using the revised delineation of South Africa's TGB by Mucina & Rutherford (2006), included the status and extent of the protected area network up to 2005. Coincidentally, the year 2006 was also significant as it marked the beginnings of the Biodiversity Stewardship Programme (BSP) in South Africa's TGB (see results section for further information).

The categories 'nature reserve' and 'protected environment' were selected because they are both formal legal instruments constituted through the National Environmental Management: Protected Areas Act (57 of 2003), and as such offer the highest levels of protection, regardless of whether the land is privately, communally, or state-owned. Two analyses were undertaken in this regard: (1) formal gains based on declarations gazetted between 2006 and early 2014 (the gazetted areas of each protected area were extracted from gazette notices and the areas of each were summed to form a total area

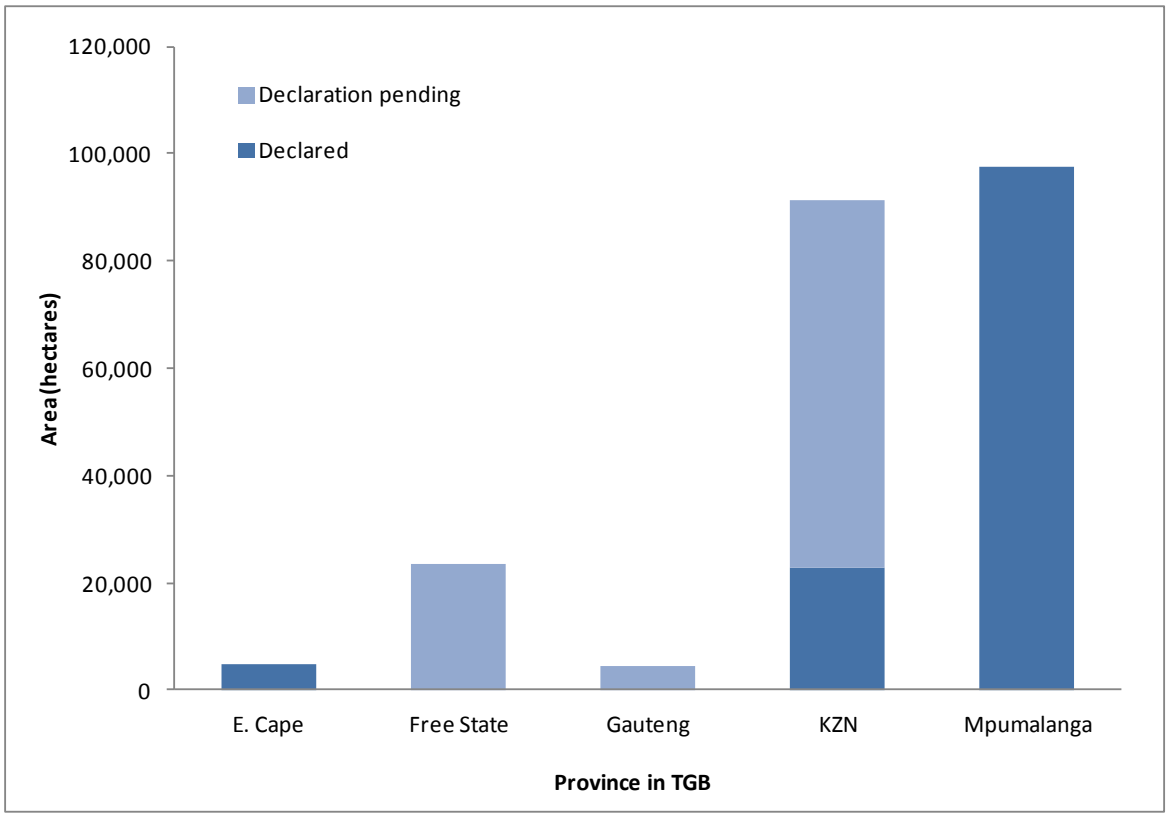

Figure 2: Temperate indigenous grassland gains, and anticipated future gains, in each of the five contributing provinces located in the Temperate Grassland Biome (TGB) of South Africa
Abbreviations: E. Cape, Eastern Cape; KZN, KwaZulu-Natal

representing the overall gain); and (2) pending gains based on properties currently engaged in the declaration process, most of which should be gazetted by the end of 2014.

Finally, we applied four important rules, where applicable. Firstly, in order to prevent over-reporting, the gains reported here should not have been reported elsewhere. An example is Mbona Private Nature Reserve, recently declared under national legislation through the BSP. This protected area was declared previously in 2005 as Mbona Mountain Estate under *provincial* legislation [KwaZulu-Natal Nature Conservation Management Act (Act 9 of 1997)] and has therefore already been reported as a gain. Secondly, by their intrinsic nature, the temperate indigenous grasslands of Africa are sometimes associated with relatively small temperate forest patches where aspect, temperature and hydrology allow (Mucina & Rutherford, 2006), the latter likened to 'islands in a sea of grassland' (Meadows & Linder, 1989; Meadows & Linder, 1993). Therefore some of the temperate grassland gains reported here include relatively small patches of forest. However, the gain contributed by the protected area was considered null and void if the property, located within a broader matrix of temperate grassland, comprised entirely of temperate forest. For this reason two recently declared protected areas, Forest Side Nature Reserve and Weza Protected Environment, were excluded. Thirdly, if the protected area spanned two or more biomes, i.e. the TGB and adjoining biome(s), then only the TGB portion was used for this assessment, noting also rule two above. Fourthly, we had to further interrogate the protected environment declarations since they *may* by definition include areas of transformation (principally through agricultural land use). Using habitat information from the site evaluation forms, we excluded the areas of transformation from the total gazetted area so that we are reporting only on untransformed areas under formal protection. Therefore, the gains reported here for two protected environments are less than their official gazetted area.

THE GAINS

Since 2006, an additional 124,983 ha of temperate indigenous grassland have come under formal protection due to the declaration of 22 new protected areas, and the purchase of two properties which have been incorporated into an existing protected area (Figure 1; Appendix 1). The overall level of protection in the TGB has thereby increased from 2.04 per cent (Carbutt et al., 2011) to 2.38 per cent. Most of the newly declared protected areas are located in Mpumalanga and KwaZulu-Natal (Figure 2), the two provinces with the longest history of biodiversity stewardship in South Africa's TGB (Table 1). It is not

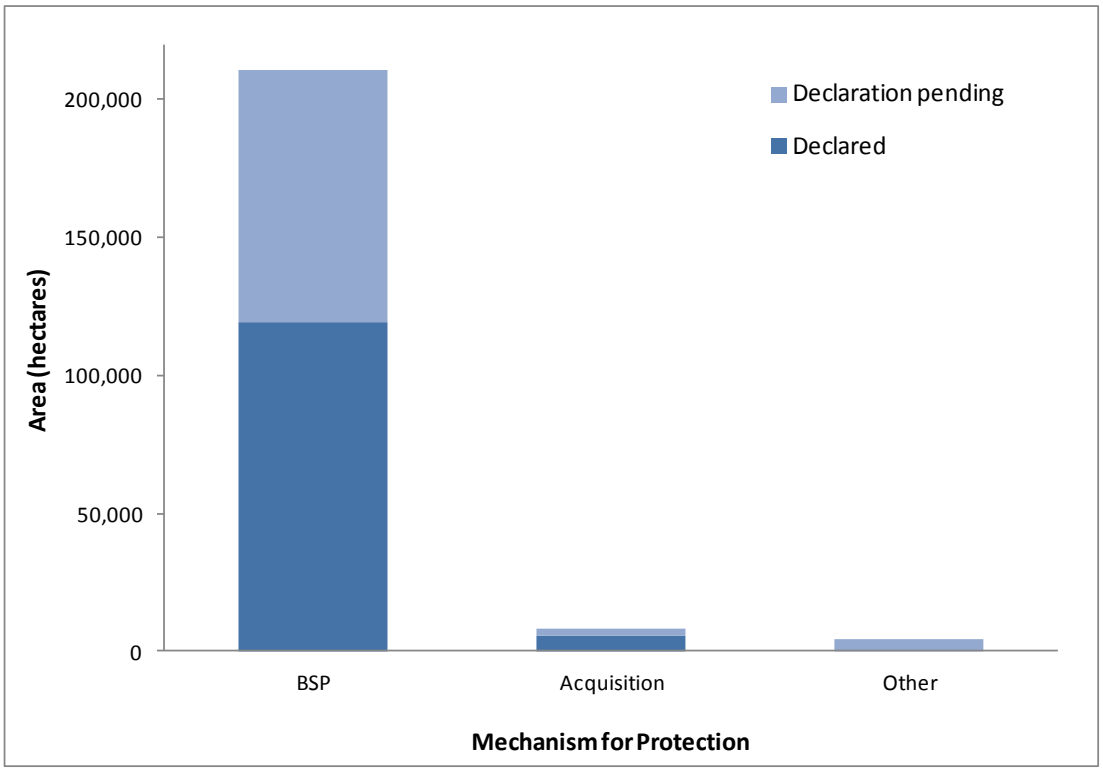

Figure 3: Temperate indigenous grassland gains, and anticipated future gains, by each of the three mechanisms employed in the Temperate Grassland Biome of South Africa

Abbreviation: BSP, Biodiversity Stewardship Programme. 'Other' refers to the programme of re-declaring protected areas under national legislation

surprising that some 95 per cent of the declarations were secured through the BSP on private and communal land (Figure 3). In terms of the grassland bioregions, most of the newly declared protected areas occur within the sub-escarpment grassland and mesic highveld grassland bioregions of the TGB (Figure 1). Most of the recently established protected areas are high water yield areas and therefore have high value in terms of ecological infrastructure (defined here as the natural capital from which ecosystem goods and services are derived).

Included in these gains is the significant landmark of declaring a protected area on land owned by an agroforestry company - Mt Gilboa Nature Reserve, owned by Mondi Limited, is the first such example in the industry. Other agroforestry companies, in their pursuit of environmental consciousness and sustainability, are following suit. More recent examples include the Weza (Merensky Timber Limited) and Excelsior (Mondi Limited) Protected Environments. As mentioned previously, the former does not form a further part of this study as it is entirely naturally forested. Another landmark is the declaration of the first community-owned protected environment in South Africa, namely Mndawe Trust Protected Environment. The largest gain is Chrissiesmeer Protected Environment, a 59,432 ha matrix of privately owned land located in what has been referred to as South Africa's 'lake district', characterised by a high density of lakes and pans. Another large gain, the 23,658 ha KwaMandlangampisi Protected Environment located between Wakkerstroom and Luneberg in southern Mpumalanga, is the first protected environment declared in South Africa and forms part of the Enkangala Grassland Project Area (Dugmore, 2010), an area under heavy pressure from the open-pit coal mining industry (see Figure 1; Appendix 1). Other than ensuring sound rangeland management practices and extending protection to threatened fauna, flora, and temperate indigenous grassland vegetation types such as Paulpietersburg Moist Grassland and Wakkerstroom Montane Grassland, this protected area also secures a critical water catchment area for South Africa. The headwaters of the Pongola and Assegaai Rivers feed into the Heyshope Dam, providing clean water for national power generation, agriculture, as well as potable water for domestic consumption (Dugmore, 2010). The protection and better management of such water catchments can only benefit the water utilities and water governing authorities by ensuring a greater volume of runoff as well as a cleaner supply of water that will extend the life span of impoundments and save significant costs in the long term. This is not a new concept. The similarly-sized Te Papanui Conservation Park in the eastern Otago uplands of New Zealand's South Island, appropriately dubbed a 'Waterlands Park' by the local conservation authority, protects a high water yield area of tall snow tussock grassland that supplies more than 60 per cent of Dunedin City's water (Mark & Dickinson, 2008; Mark, 2012).

The only recent acquisitions in the TGB are the properties 'Portion 2 of the Farm Middle Drai No. 4129' (386 ha), purchased in 2003 for ZAR 320,000, and 'remainder of the Farm Dartmoor No. 5093' (779 ha),

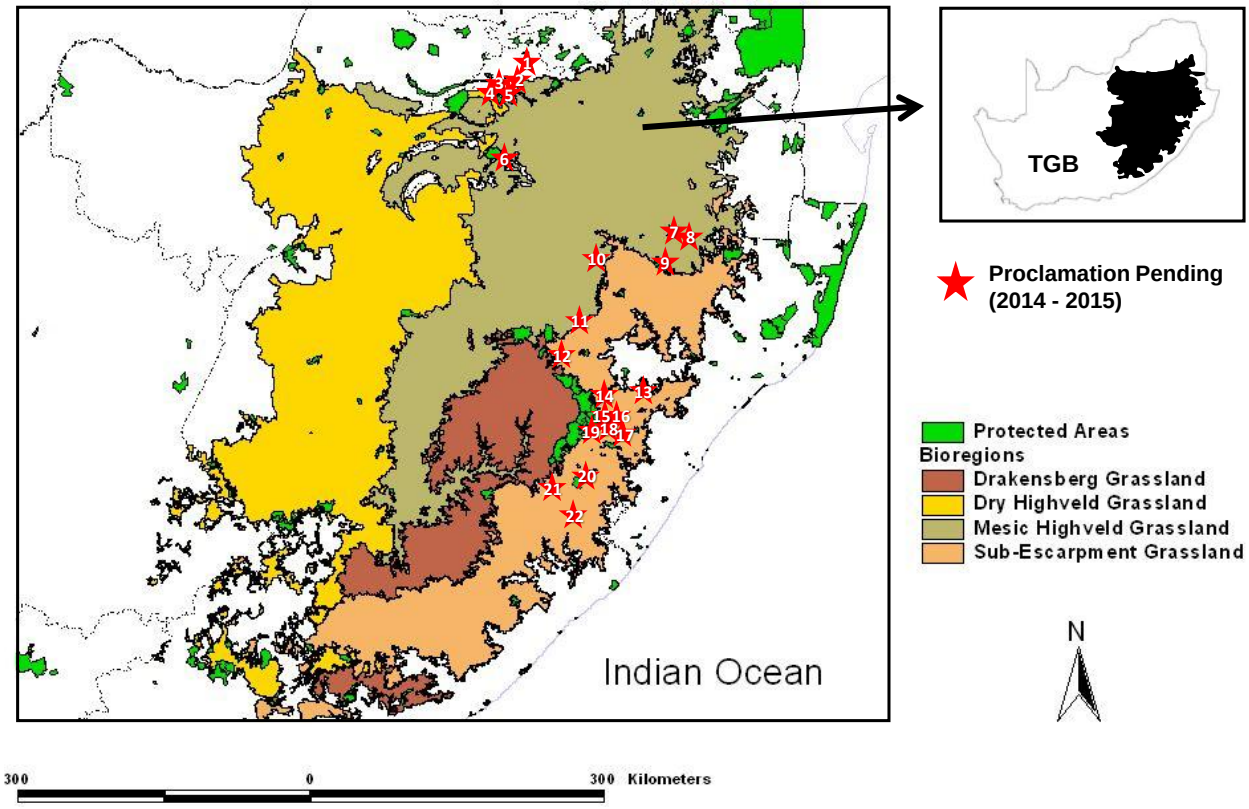

Figure 4: Map of the Temperate Grassland Biome (TGB) in South Africa, Lesotho and Swaziland, showing the four grassland bioregions, and the proposed temperate indigenous grassland protected areas that will be declared in the near future (2014 - 2015) shown as red stars relative to the protected area network pre-2006 (shown in green). Adapted from Carbutt et al. (2011) using the bioregion delineation of Mucina & Rutherford (2006)

Key to proposed temperate indigenous grassland protected areas listed from north to south: 1. Leeuwfontein Nature Reserve; 2. Roodeplaat Nature Reserve; 3. Colbyn Valley Protected Environment; 4. Klapperkop Nature Reserve; 5. Faerie Glen Nature Reserve; 6. Alice Glockner Nature Reserve; 7. Arrarat Nature Reserve; 8. Pongola Bush Protected Environment (expansion); 9. Mabaso Protected Environment; 10. Sneeuwberg Protected Environment; 11. Ingula Nature Reserve; 12. Upper uThukela Nature Reserve; 13. Lake Merthley Nature Reserve; 14. Zulu Waters Game Reserve (expansion); 15. Allendale Nature Reserve; 16. Fort Nottingham Nature Reserve (expansion); 17. Bosch Berg Nature Reserve; 18. Umgeni Vlei Plateau Nature Reserve; 19. Saddle Tree Protected Environment; 20. Umgano Nature Reserve; 21. Beaumont Nature Reserve; 22. Mt Currie Nature Reserve (expansion)

purchased in 2010 for ZAR 3.2 million (ZAR is currently trading at 11.00 to the US$ although was firmer against the US$ at the time). Both properties adjoin, and have thus been incorporated into, the Karkloof Nature Reserve through declaration in 2012. These properties were purchased by Wildlands Conservation Trust and donated to the Board of the local provincial conservation authority, Ezemvelo KwaZulu-Natal Wildlife. Although not a recent acquisition, Matatiele Nature Reserve (4800 ha), located in the north-eastern corner of Eastern Cape, was established as the Matatiele Commonage when the town became a municipality by declaration in 1904 (Matatiele Local Municipality, 2009). It was only declared a nature reserve over 100 years later, in 2007, with the local municipality serving as the management authority. This gain finally has legal standing and is a welcome boost to the protection of sub-escarpment grasslands in the region (see Figure 1; Appendix 1).

A further 96,641 ha, relating to 22 proposed protected areas, are in the declaration process, most of which should be secured by the end of 2014 (Figure 4; Appendix 2). This increased area will boost the overall level of protection in the TGB to 2.65 per cent. Most of the proposed protected areas are located in KwaZulu-Natal and Free State (Figure 2), with 95 per cent of the proposed declarations being secured through the BSP on private and communal land (Figure 3). These future gains are located mostly within the mesic highveld and sub-escarpment grassland bioregions (Figure 4). Future efforts should include the semi-arid grasslands of the dry highveld grassland bioregion. The largest pending gain is the 44,525 ha Upper uThukela Nature Reserve in KwaZulu-Natal (Figure 4; Appendix 2), strategically consolidating the fragmented Maloti Drakensberg Transfrontier World Heritage Site. Another exciting prospect in the declaration process is the Sneeuwberg

The black wildebeest, or white-tailed gnu (*Connochaetes gnou*), is a selective grazer of South Africa's temperate indigenous grasslands © Clinton Carbutt

Protected Environment, a 17,456 ha area (Figure 4; Appendix 2) located in the eastern Free State, a more recent proponent of the BSP (Table 1). This proposed protected area will contribute to the protection of Amersfoort Highveld Clay Grassland, Eastern Free State Sandy Grassland, Low Escarpment Moist Grassland and Eastern Temperate Freshwater Wetlands (*David Hayter, pers comm*). Another milestone in the making is the proposed Ingula Nature Reserve, a 9437 ha trans-provincial protected area spanning Free Sate and KwaZulu-Natal (Figure 4; Appendix 2). The project is funded by the parastatal power-generating utility Eskom, with technical support from the conservation NGO, Wildlands Conservation Trust. This will be the first private nature reserve declared by a national minister (and not by provincial members of the executive council) because it stretches across two provinces (*Kevin McCann, pers comm*). A few of the smaller pending gains, located in impoverished communal areas (e.g. the proposed Umgano Nature Reserve; Plate 1A), are central to progressive conservation projects aimed at generating sustainable livelihoods by integrating biodiversity conservation, ecotourism, and small-scale agriculture.

The approach adopted by Gauteng was to first secure and consolidate its exiting protected area estate (declared historically under provincial legislation and without fulfilling the more rigorous criteria necessitated by national protected area legislation) by re-declaring its protected areas under national legislation. This process involved boundary surveys though a professional land surveyor, improved mapping and public participation (*Terence Venter, pers comm*). It seems that some of Gauteng's original provincial declarations, relating to smaller reserves, were not captured in the national protected areas database, and as a result were not included in the assessment by Carbutt et al. (2011). These have since been captured as pending formal gains in this assessment (Figure 4; Appendix 2). However, a suite of generally larger Gauteng nature reserves that are also in the process of being re-declared under national legislation are not considered further in this study since they have been reported as gains previously (see Carbutt et al., 2011). Examples include Groenkloof, Marievale, Rietvlei Dam, Suikerbosrand and Voortrekker Monument Nature Reserves.

THE DRIVERS

Perhaps as important as the gains themselves, which may seem trivial at a global scale, are the interventions that have been applied and lessons that have been learned, many of which may benefit the global temperate grassland community. Four interventions, all in the past 10 years, have generated unprecedented momentum to temperate indigenous grassland conservation in South Africa. These are detailed below.

1. National Protected Area Expansion Strategy: this Strategy was commissioned by South Africa's national Department of Environment Affairs – known at the time as the Department of Environment Affairs and Tourism – with technical support from the South African National Biodiversity Institute and South African National Parks. In 2007, a project team representing the aforementioned departments provided technical oversight to specialist consultants contracted to draft the strategy in 2008, in close collaboration with other key national government departments, and national and provincial conservation institutions (SANBI & DEAT, 2008), all of whom were overseen by the task team of the Ministerial Technical Committee's Working Group 1 ('Biodiversity and Heritage'). The strategy team further consulted with the 'People and Parks' stakeholders.

The Strategy, endorsed through the co-operative governance structures established by national government (SANBI & DEAT, 2008) and approved by the National Minister of Environmental Affairs for implementation in March 2009, recommends that a further 12 per cent of land in the TGB should be formally protected as part of the 20-year protected area expansion targets for South Africa (SANBI & DEAT, 2008). At a more local level, provincial conservation authorities are in the process of embracing the protected area expansion targets identified nationally for the respective provinces by drafting provincial protected area expansion plans (e.g. Morris & Corcoran, 2009; Carbutt & Escott, 2010; Martindale & de Frey, 2011). Most provinces with temperate indigenous grasslands now have provincial protected area expansion strategies in place to secure this threatened biome (Table 1).

This 20-year strategy has been an invaluable framework for identifying national priorities and setting national and provincial protected area expansion targets. It also aims to secure buy-in from conservation authorities by holding them accountable to discrete targets. A critical challenge in implementing such a strategy is devolving and communicating the provisions, policies, signed agreements, authorizations, and endorsements at the level of national government through provincial and local government structures.

2. Grasslands Programme (Phase 1: 2008 - 2013): the Global Environment Facility (GEF) of the United Nations Development Programme has funded phase 1 (2008 - 2013) of a 20-year focussed thematic programme in South Africa which aims to "secure the biodiversity and associated ecosystem services of the Grassland Biome for the benefit of current and future generations" (SANBI, 2008; Stephens, 2009). The Grasslands Programme, with the South African National Biodiversity Institute as its implementing agency, is a strategic partnership between multiple spheres of government, NGOs, as well as private and academic sectors (Stephens, 2009). Phase 2 is aimed at sustaining the gains achieved in Phase 1 and a sustainability plan to galvanise the outcomes of Phase 1 and ensure overall delivery on the 20-year strategy has been developed in this regard (Ginsburg, 2013; Ginsburg et al., 2013). The Grassland Programme is one of few GEF-funded projects to embrace reflective and consultative planning for sustainability (*Anthea Stephens, pers comm*). The Grasslands Programme has initiated a number of key interventions, many of which are focussed within the following three strategic focus areas:

i. Mainstreaming grassland conservation in production sectors: a key strategy of the Grasslands Programme is mainstreaming grassland conservation objectives in the major production sectors operating in the TGB (being the main drivers of biodiversity loss), primarily the agriculture, agroforestry, urban development, and coal mining sectors (SANBI, 2008; Stephens, 2009; SANBI & DEA, 2013; Ginsburg et al., 2013). This strategy includes interventions to ensure that production sectors incorporate biodiversity objectives into operational plans, policies and decision making, while at the same time addressing institutional and policy level barriers, correcting market failures and improving incentives (SANBI, 2008; Stephens, 2009; SANBI & DEA, 2013; Ginsburg et al., 2013). More on-the -ground interventions include better management and formal protection of unplanted areas (Ginsburg et al., 2013). Some of the engagements with the production sectors have been addressed through the annual Grasslands Partner's Forum, a platform to engage formally with key representatives of each production sector to ensure systemic, long-term interventions. Additionally, a further need has been identified to mainstream grassland conservation not only in production sectors but also with government departments whose authorisations in line with their mandates may have significant (negative) impacts on grassland integrity (e.g. Department of Agriculture - food security; Department of Water Affairs - water security).

ii. Creating an enabling environment: the Grasslands Programme has been very effective at creating an enabling, cohesive working environment for partners and stakeholders, particularly in the areas of policy development, as well as technical and financial support. Examples include assistance with a 'Business Case for Biodiversity Stewardship' to galvanise the implementation of biodiversity stewardship as a critical

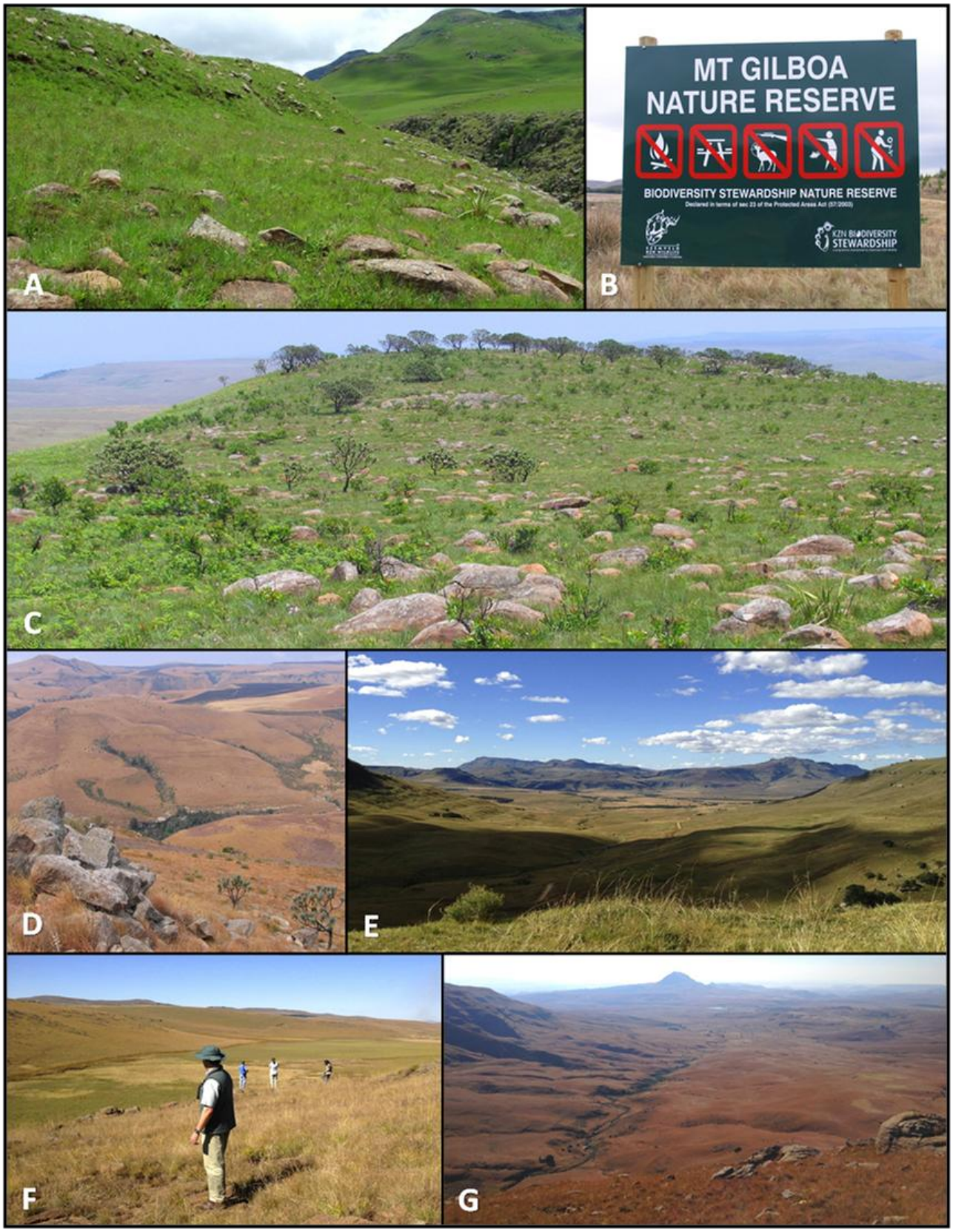

Plate 1: Examples of newly declared, or soon-to-be declared, temperate indigenous grassland protected areas in South Africa. A, the proposed Umgano Nature Reserve, initiated by the Mabandla Community in the remote Ntsikeni region © Clinton Carbutt. This area supports a temperate grassland vegetation type known as Drakensberg Foothill Moist Grassland, on relatively steep and rocky slopes; B. & C. Mt Gilboa Nature Reserve, the first private nature reserve declared within an active agroforestry estate © Clinton Carbutt; D. the greater Ncandu expansion area © Clinton Carbutt; E. Pongola Bush Protected Environment, securing the important headwaters of the Pongola River © Greg Martindale; F. a proposed biodiversity stewardship site in the Underberg region, dominated by a large wetland system supporting the critically endangered wattled crane © Greg Martindale; G. the proposed Allendale Nature Reserve in the foothills of the KwaZulu-Natal Drakensberg © Greg Martindale

mechanism for protected area expansion and rural development (Stephens, 2009), and the piloting of Payment for Ecosystem Services projects and the Wetlands Offsets project (Ginsburg et al., 2013). Other examples of key products enabled through the Programme are the Grassland Ecosystem Guidelines, the Mining and Biodiversity Guideline, the Biodiversity-friendly Red Meat Standard, and the Biodiversity-friendly Grazing and Burning Guidelines for South Africa's Grasslands. The latter product is a timely necessity, given the national debate centred around the influence of grazing on rangeland diversity in South Africa (e.g. O'Connor, 2005; O'Connor et al., 2010; O'Connor et al., 2011).

iii. Shaping policy and political mindsets: according to Tau & Stephens (2012), the term 'biodiversity' is not well understood in the political arena in South Africa and therefore decision making does not often reflect biodiversity priorities. Adding further to this woe is that communication from the biodiversity sector is sometimes contradictory and often confusing, and the link between economic development and biodiversity is not well understood. The result is that biodiversity is commonly seen as being in competition with socio-economic imperatives. Furthermore the 'fear of loss' messages of doom and gloom, inundated with stories of degradation, extinction, species loss and habitat transformation do not resonate with politicians and decision makers who generally want more positive stories (Tau & Stephens, 2012). The Grasslands Programme has worked hard at demystifying the term 'biodiversity' by crafting compelling positive messages (using the 'hope of gain' language) that communicates the value of natural capital and ecological infrastructure to the economy of the country and to rural development (Tau & Stephens, 2012). Key challenges to their 'making the case for biodiversity' sector messaging strategy have centred around: (1) how to frame the case for temperate indigenous grassland conservation within the broader needs of a developmental society in a way that resonates with the government priorities of job creation, rural development, growth and equity; and (2) how to ensure that grassland conservation answers both a rational need and an emotional need (the champions of biodiversity need to demonstrate practically the value of grassland biodiversity if they are to succeed in securing scarce government resources) (Tau & Stephens, 2012; SANBI, 2014). These high-level engagements are long-term interventions aimed at informing and changing political mindsets towards the value of biodiversity to the benefit of not only temperate indigenous grasslands but South Africa's biodiversity at large.

3. Biodiversity Stewardship Programme: despite protected area expansion strategies in South Africa identifying up to 18 options to increase the terrestrial area of the country under formal protection (Carbutt & Escott, 2010), the mechanism of choice most heavily utilized in the country in the past decade is biodiversity stewardship, where the level of contractual agreement is dependent on the biodiversity value of the property and landowner willingness. The BSP has ushered in a whole new era of protected area expansion opportunities not previously considered by, or available to, the private land holder and has contributed to the formal conservation estate in ways never deemed possible in the past (for operational procedures refer to Ezemvelo KwaZulu-Natal Wildlife, 2008). Other mechanisms such as land purchases are becoming increasingly unpalatable to the governing authorities, most likely due to a slowing global economy and shrinking government budgets stretched to accommodate a host of other competing needs including the rhino poaching epidemic. High land prices are also a contributing factor, which for temperate indigenous grassland properties amounts to *c.* ZAR 3000 to ZAR 5000 per hectare (*Robert Turner, professional property valuator, pers comm*).

The BSP was pioneered in the fynbos-dominated Western Cape in 2002, through a two-year partnership project between CapeNature and the Botanical Society of South Africa, funded by the Critical Ecosystems Partnership Fund (CapeNature, 2009). The BSP only reached the TGB four years later when biodiversity stewardship began in KwaZulu-Natal in 2006. The first declarations in the TGB achieved through the BSP were in 2009 (Appendix 1). Most provinces located within the TGB now have BSP units in place (Table 1).

The BSP is well favoured in South Africa because it makes good business sense. A costing exercise by Morris & Corcoran (2009) has shown that the BSP costs a quarter of that needed for land acquisition, even though the model assumed that the BSP will be used 90 per cent of the time, and land acquisition only 10 per cent of the time. However, in response to the more rigorous demands of national protected area legislation, and therefore having to offer a more robust framework for securing the protected area estate, the BSP still carries cost implications, although not to the extent of land purchases. Costs relate to the employment of biodiversity stewardship managers and their teams of facilitators, and the establishment phase involves costs relating to boundary surveys, public participation, and title deed endorsement through a notary prior to gazetting. The maintenance phase too has cost implications, and not only for the landowner. Provincial conservation

South Africa's temperate indigenous grasslands often form part of important water catchment areas, having high value in terms of ecological infrastructure © Clinton Carbutt

authorities have to employ district staff, facilitators and ecologists who all engage with the landowner in the establishment *and* maintenance phases. It is estimated that a single facilitator should be responsible for no more than 15 sites (Olivier, 2012). Therefore, the '*no* ongoing management costs' mindset involving the BSP is unfortunately a misconception. Furthermore, for the BSP to succeed, a 'mating for life' symbiotic commitment between state and landowner has to be in place in perpetuity.

Evident from the results is that 95 per cent of the gains achieved for temperate indigenous grassland conservation are the direct result of the BSP (Figure 3). A significant contribution of the BSP is its role in helping to achieve protected area expansion and biodiversity targets. By securing further habitat such as the endangered Midlands Mistbelt Grassland vegetation type, the BSP has contributed to the protection of the endangered Oribi Antelope (*Ourebia ourebi*), the critically endangered Wattled Crane (*Bugeranus carunculatus*), and the critically endangered Blue Swallow (*Hirundo atrocaerulea*). The gains achieved through the BSP also resonate in terms of formally securing high water yield areas.

Informal contributions through Conservancies, Sites of Conservation Significance and Natural Heritage Sites, none of which are declared formal nature reserves, can now be superseded by a reputable programme that gives private landholders an opportunity to own and manage formal conservation areas on equal standing with state-managed protected areas and thereby contribute to the formal conservation estate both in terms of area under protection and biodiversity target achievement. The BSP also allows better scrutiny of the private offering and imposes a uniformly high standard of protected area management with title deed endorsement. The BSP model also offers a wide range of landowner extension support, including assistance with burning programmes (e.g. pre-burn inspections and advice on burning regimes), invasive alien plant control (including the supply of herbicides) and wetland rehabilitation (Dugmore, 2010). The BSP is well aligned with Natural Resource Management Programmes to harness funding made available in such landcare-orientated initiatives. The BSP is also well favoured because landowners benefit from incentives including tax rebates and rates exemptions. Furthermore, in pursuing the BSP in South Africa, two key serendipitous spin-offs have also been generated:

i. A dynamic and flexible framework to explore new models of protected area expansion and co-management: where possible, BSP sites are often strategically linked to 'anchor tenant' state-managed protected areas to improve connectivity through the creation of biologically meaningful corridors and contiguous linkages, especially important in climate change mitigation and adaptation, enhanced delivery of ecosystem goods and services, and maximization of water yield areas. However, the BSP model allows even further flexibility and innovation in the design and management of the protected area estate, for example the practice of joint declarations between state-managed and private neighbouring protected areas, culminating in co-management agreements. A good example is Fort Nottingham Nature Reserve, a small temperate indigenous grassland reserve in the KwaZulu-Natal Midlands. A process has been initiated whereby this state -managed protected area (130 ha), and the neighbouring private property (1096 ha) earmarked for declaration through the BSP, will be gazetted as a single protected area (1226 ha) represented by a dual management authority (established through a Land Management Association represented by either state-municipal or state-private partners) and managed from a single management plan. Further benefits include simplified management boundaries, enhanced ecological processes, synergistic law enforcement efforts and the production of management plans for state-managed reserves that previously were not in place.

ii. Botanical exploration of previously unexplored or under-explored areas: another dynamic spin-off from the BSP is the new territories that have opened up to botanical exploration by both professionals and amateurs. A number of properties in the TGB were complete botanical unknowns ('black holes'): previously impenetrable and inaccessible to the outside world, either because these properties were unknown or because it was not possible to obtain landowner consent, especially in communal areas, where determining land ownership is often a challenge. With the owners of such properties now volunteering for the BSP, renewed collecting efforts to document a baseline flora as part of the site review and management plan process has resulted in the discovery of new (and presumably rare) plant species such as the milkweed, *Stenostelma* sp. (Apocynaceae), from the proposed Arrarat Nature Reserve (*Isabel Johnson, pers comm*), or range expansions of rare plant species, known from only few sites (Ramdhani & Carbutt, in preparation).

4. Critical Ecosystems Partnership Fund: this Fund, founded in 2000, is a joint initiative of Conservation International (CI), l'Agence Française de Dévelopment, the GEF, the Government of Japan, the John D. and Catherine T. MacArthur Foundation, and the World Bank (CI Southern African Hotspots Programme & SANBI, 2010). The main aim of the Critical Ecosystems Partnership Fund (CEPF) is to enable civil society to participate in, and benefit from, conserving the world's most critical ecosystems, and it therefore funds projects in global biodiversity hotspots. The CEPF has recently invested heavily into the Maputaland-Pondoland-Albany Hotspot, one of South Africa's three global biodiversity hotspots (CI Southern African Hotspots Programme & SANBI, 2010), and the only one located in the summer rainfall region. This hotspot extends to the base of the Drakensberg Alpine Centre and thereby fortunately includes the poorly conserved sub-escarpment grasslands of the TGB (Carbutt et al., 2011).

The funding provided by the CEPF in hotspots is designed to reach civil society in a way that complements previous investments and government priorities, and is committed to enabling NGOs *and* private/communal landowners to help protect vital ecosystems through innovative conservation activities (CI Southern African Hotspots Programme & SANBI, 2010; CEPF, 2012). However, regarding private landowners it is mainly the multiple landowner partnerships such as conservancies that qualify for funding (*Roelie Kloppers, pers comm*). This investment may help to facilitate the formalization of such informal conservation areas through declaration should the landowners be willing and the land be of sufficiently high biodiversity value. It is also important to note that it was funding from the CEPF that enabled the BSP to gain a foothold in South African conservation and contribute as a core member of the strategy.

The project proposals have to fall within the CEPF's five strategic directions for the hotspot, and to benefit conservation in the TGB, the proposals must align with strategic directions 2 and/or 3: ("expand conservation areas and improve land-use in 19 key biodiversity areas" and/or "maintain and restore ecosystem function and integrity in the Highland Grasslands") (CI Southern African Hotspots Programme & SANBI, 2010).

Given that the limitation to formally securing land for conservation is not the lack of site availability or landowner willingness, but rather the limited number of BSP facilitators employed by conservation authorities to broker stewardship contracts, the CEPF has to some degree helped unlock this output bottleneck. Grants have been awarded to the following experienced and reputable NGOs to employ facilitators: WWF-South Africa

South Africa's temperate grasslands are rich in forbs, such as this species of *Brunsvigia* (Amaryllidaceae) © Clinton Carbutt

(Grasslands Programme); BirdLife South Africa; Botanical Society of South Africa, Wildlands Conservation Trust (MPA Hotspot regional implementation team), Endangered Wildlife Trust (Threatened Grassland Species Programme), and the Midlands Conservancies Forum. Given this range of facilitators operating in the country, it is essential to formalise the government-NGO partnerships and ensure consistency in the way that their operations are conducted. To this end, Memorandums of Agreement have been developed between provincial government and its partners and a forum established for all partners to meet on a quarterly basis through a Working Group. We reaffirm that multiple government-NGO enabling partnerships will be key to securing temperate indigenous grasslands in South Africa and in other parts of the world.

CONCLUSION

Temperate indigenous grassland conservation in South Africa has benefitted greatly from four key interventions, namely the National Protected Area Expansion Strategy, the Grasslands Programme of the South African National Biodiversity Institute, the establishment of provincial biodiversity stewardship units (as the key mechanism to formally secure private and communal land to expand the temperate indigenous grassland conservation estate), and CEPF funding channelled into civil society. Given the clear benefits derived from each intervention, relevant countries with temperate indigenous grasslands are encouraged to develop similar structures. South Africa is learning that well-resourced BSP units are fundamental to national and provincial biodiversity conservation strategies and are the single most important intervention to formally secure land for biodiversity conservation, and bring threatened species and habitat under protection. However, the national and provincial governments have not fully comprehended the true value of the BSP, especially given that the alternative, land acquisition, has fallen out of favour. Therefore, government-funded BSP units in South Africa remain under-resourced and under-capacitated.

The success of the BSP will be undermined if private landowners do not comply with the management plan and the state does not employ further district staff and ecologists to service the growing number of sites. To avoid the 'paper park' syndrome, each temperate indigenous grassland protected area should be assessed on an annual basis using best-practice management effectiveness assessments (Carbutt & Goodman, 2013), involving landowner, facilitator, ecologist, district conservation officer and an independent assessor. Such a programme, already well entrenched in state-managed protected areas in South Africa (Britton, 2010; Carbutt & Goodman, 2010) should also become standard practice for sites secured through the BSP.

The gains since 2006 have increased formal protection in South Africa's TGB from 2.04 per cent (Carbutt et al., 2011) to 2.38 per cent, which is still well below acceptable limits. However, given the good systems in place and the large number of sites in the declaration process, the area under formal protection will increase further to at least 2.65 per cent in the foreseeable future. A more realistic picture of transformation in the TGB can only be gleaned from an updated National Land Cover which is still outstanding (the current coverage is based on outdated satellite imagery from 2000).

Making the case for the value of the TGB will require repeated and sustained efforts in order to make headway in the political arena and production sectors in South Africa, so a 'building the case' approach is advocated. Fortunately, the sleeping giant is awakening and perceptions are slowly shifting from an 'unimproved' agricultural-based working landscape mentality towards a more realistic appraisal of a mega-biome harbouring significant biomass, as well as myriad threatened and awe-inspiring biodiversity. Temperate indigenous grassland conservation should receive more attention on the global conservation agenda and every conceivable effort should be made to halt further habitat and species loss in this imperilled global biome.

ACKNOWLEDGEMENTS

Thando Msomi (Matatiele Local Municipality), Dave Hayter (Free State Department of Economic Development, Tourism and Environmental Affairs), Tracey Potts (Eastern Cape Parks and Tourism Agency), Kevin McCann (Wildlands Conservation Trust), Brian Morris, Mervyn Lotter and Frik Bronkhorst (Mpumalanga Tourism and Parks Agency), Ray Schaller and Moremi Lesejane (North West Department of Economic Development, Environment, Conservation and Tourism), John Burrows (Buffelskloof Private Nature Reserve), Abigail Kamineth and Terence Venter (Gauteng Department of Agriculture and Rural Development), David Boshoff (City of Tshwane), Dr Charmaine Uys (BirdLife South Africa), Vanessa Stone (WWF-South Africa) and Kerry Purnell (CapeNature) are all thanked for supplying relevant information in its various forms. Bimal Naidoo is thanked for GIS assistance. The monumental work undertaken by the Grasslands Programme of the South African National Biodiversity Institute in just five years, and the dedication of biodiversity stewardship units in the various provinces is lauded with appreciation and admiration. The immense contribution from NGOs is acknowledged.

Appendix 1: The most recent declarations in the temperate indigenous grassland biome of South Africa. Protected areas are listed by date of declaration. If the protected area is not entirely temperate grassland, or in the case of protected environments that sometimes include areas of transformation, the area of temperate grassland is listed first, followed by the total gazetted area in brackets. BSP, Biodiversity Stewardship Programme

Protected Area (as per gazette notice)	Province	Declaration Level	Month & Year Declared	Gazetted Area (ha)	Management Authority	Mechanism	Reference no. as per Figure 1
Matatiele Nature Reserve	Eastern Cape	Nature Reserve	September 2007	4800	Matatiele Local Municipality	Acquisition (historic)	22
Bill Barnes Crane and Oribi Nature Reserve	KwaZulu-Natal	Nature Reserve	January 2009	450	KwaZulu-Natal Crane Foundation	BSP	15
Dalton Private Reserve (trading as Zulu Waters Game Reserve)	KwaZulu-Natal	Nature Reserve	January 2009	2463	Zulu Waters Trust	BSP	12
Mt Gilboa Nature Reserve	KwaZulu-Natal	Nature Reserve	January 2010	717	Mondi Limited	BSP	13
Roselands Nature Reserve	KwaZulu-Natal	Nature Reserve	July 2010	401	Landowner	BSP	20
Gelijkwater Misbelt Nature Reserve	KwaZulu-Natal	Nature Reserve	February 2011	829	Mondi Limited	BSP	11
Hilton College Nature Reserve	KwaZulu-Natal	Nature Reserve	February 2011	458	Hiltonian Society	BSP	17
Karkloof Nature Reserve (Farm Dartmoor)	KwaZulu-Natal	Nature Reserve	August 2012	779	Ezemvelo KwaZulu-Natal Wildlife	Acquisition	13
Karkloof Nature Reserve (Farm Middle Drai)	KwaZulu-Natal	Nature Reserve	August 2012	386	Ezemvelo KwaZulu-Natal Wildlife	Acquisition	13
KwaMandlangampisi Protected Environment	Mpumalanga	Protected Environment	September 2010	23,658	KwaMandlangampisi Protected Environment Landowners Association	BSP	5
Buffelskloof Private Nature Reserve	Mpumalanga	Nature Reserve	May 2012	150 ha of Lydenburg Montane Grassland (1484)	Buffelskloof Private Nature Reserve Trust	BSP	3

Continued overleaf

Appendix 1: Continued....

Protected Area (as per gazette notice)	Province	Declaration Level	Month & Year Declared	Gazetted Area (ha)	Management Authority	Mechanism	Reference no. as per Figure 1
Kudu Private Nature Reserve	Mpumalanga	Nature Reserve	May 2013	400 ha of Steenkampsberg Montane Grassland (transition) (4794)	Kudu Game Ranch Share Block Limited	BSP	1
Blue Crane Nature Reserve	KwaZulu-Natal	Nature Reserve	October 2013	701	Jackson Trust	BSP	14
Clairmont Nature Reserve	KwaZulu-Natal	Nature Reserve	October 2013	1869	Sappi Southern Africa (Pty) Ltd	BSP	19
Excelsior Protected Environment	KwaZulu-Natal	Protected Environment	October 2013	1314 (1967)	Mondi Limited	BSP	21
Michaelhouse Nature Reserve	KwaZulu-Natal	Nature Reserve	October 2013	234	St Michael's Dioscesan College	BSP	16
Mount Shannon Protected Environment	KwaZulu-Natal	Protected Environment	October 2013	1395 (4414)	Mondi Limited	BSP	18
Ncandu Private Forest and Grassland Reserve	KwaZulu-Natal	Nature Reserve	October 2013	1388	Ncandu Reserve Private Landowners Association	BSP	10
Pongola Bush Protected Environment	KwaZulu-Natal	Protected Environment	October 2013	9259	Pongola Bush Protected Environment Landowners Association	BSP	9
Chrissiesmeer Protected Environment	Mpumalanga	Protected Environment	January 2014	59,432	Chrissiesmeer Protected Environment Landowners Association	BSP	4
KwaMandlangampisi Protected Environment (expansion)	Mpumalanga	Protected Environment	January 2014	3094	KwaMandlang-ampisi Protected Environment Landowners Association	BSP	6
Mabola Protected Environment	Mpumalanga	Protected Environment	January 2014	8772	Mabola Protected Environment Landowners Association	BSP	8
Mndawe Trust Protected Environment	Mpumalanga	Protected Environment	January 2014	826	Mndawe Trust	BSP	2
Tafelkop Nature Reserve	Mpumalanga	Nature Reserve	January 2014	1208	Landowner	BSP	7
Total (ha)				124,983			

Appendix 2: Proposed protected areas to be declared as either nature reserves or protected environments in the temperate indigenous grassland biome of South Africa in the near future. We anticipate that the majority of the gazette notices will be published by the end of the 2014 financial year. Protected areas are listed by date of anticipated declaration. BSP, Biodiversity Stewardship Programme

Protected Area	Province	Declaration Level	Declaration (expected)	Area (ha)	Management Authority	Mechanism	Reference no. as per Figure 4
Alice Glockner Nature Reserve	Gauteng	Nature Reserve	Early 2014	168	Gauteng Department of Agriculture and Rural Development (Biodiversity Directorate)	Consolidation and re-declaration under national legislation	6
Colbyn Valley Protected Environment	Gauteng	Protected Environment	Early 2014	49	City of Tshwane	Declaration under national legislation	3
Faerie Glen Nature Reserve	Gauteng	Nature Reserve	Early 2014	128	City of Tshwane	Consolidation and re-declaration under national legislation	5
Leeuwfontein Nature Reserve	Gauteng	Nature Reserve	Early 2014	2338	Gauteng Department of Agriculture and Rural Development (Biodiversity Directorate)	Consolidation and re-declaration under national legislation	1
Sneeuwberg Protected Environment	Free State	Protected Environment	Early 2014	17,456	Sneeuwberg Protected Environment Landowners Association	BSP	10
Klapperkop Nature Reserve	Gauteng	Nature Reserve	Early 2014	180	City of Tshwane	Consolidation and re-declaration under national legislation	4
Roodeplaat Nature Reserve	Gauteng	Nature Reserve	Early 2014	1555	Gauteng Department of Agriculture and Rural Development (Biodiversity Directorate)	Consolidation and re-declaration under national legislation	2
Ingula Nature Reserve (also proposed as a Ramsar site)	Free State/ KwaZulu-Natal	Nature Reserve	Early 2014	9437 (Free State 6118; KwaZulu-Natal 3319)	Eskom	BSP	11
Bosch Berg Nature Reserve	KwaZulu-Natal	Nature Reserve	Mid 2014	352	Landowner	BSP	17
Umgano Nature Reserve	KwaZulu-Natal	Nature Reserve	Mid 2014	1874	Umgano Project Landowners of the Mabandla Community (Umgano Development Company)	BSP	20

Continued overleaf

Appendix 2: Continued....

Protected Area	Province	Declaration Level	Declaration (expected)	Area (ha)	Management Authority	Mechanism	Reference no. as per Figure 4
Zulu Waters Game Reserve (expansion)	KwaZulu-Natal	Nature Reserve	Mid 2014	717	Zulu Waters Trust	BSP	14
Allendale Nature Reserve	KwaZulu-Natal	Nature Reserve	Late 2014	1847	Landowner	BSP	15
Beaumont Nature Reserve	KwaZulu-Natal	Nature Reserve	Late 2014	1020	Landowner	BSP	21
Fort Nottingham Nature Reserve (expansion)	KwaZulu-Natal	Nature Reserve	Late 2014	1096	Fort Nottingham Land Owners Association	BSP	16
Lake Merthley Nature Reserve	KwaZulu-Natal	Nature Reserve	Late 2014	438	Umvoti Municipality	BSP	13
Mabaso Protected Environment	KwaZulu-Natal	Protected Environment	Late 2014	± 3000	Mabaso Community	BSP	9
Mt Currie Nature Reserve (expansion)	KwaZulu-Natal	Nature Reserve	Late 2014	± 600	Ezemvelo KwaZulu-Natal Wildlife	Acquisition (donation by Local Municipality)	22
Pongola Bush Protected Environment (expansion)	KwaZulu-Natal	Protected Environment	Late 2014	1922	Pongola Bush Protected Environment Landowners Association	BSP	8
Saddle Tree Protected Environment	KwaZulu-Natal	Protected Environment	Late 2014	615	Landowner	BSP	19
Umgeni Vlei Plateau Nature Reserve	KwaZulu-Natal	Nature Reserve	Late 2014	824	Ivanhoe Farming Company (Pty) Ltd	BSP	18
Upper uThukela Nature Reserve	KwaZulu-Natal	Nature Reserve	Late 2014	44,525	Amazizi and Amangwane Communities	BSP	12
Arrarat Nature Reserve	KwaZulu-Natal	Nature Reserve	2015	6500	Landowner	BSP	7
Total (ha)	**96,641**						

ABOUT THE AUTHORS

Clinton Carbutt is a plant and conservation scientist in the employ of Ezemvelo KwaZulu-Natal Wildlife's Scientific Services with particular interests in the biogeochemical aspects of alpine grasslands, as well as the high elevation floristics, biogeography and ecology of the Drakensberg Alpine Centre (southern Africa's only alpine region). He is also interested in temperate indigenous grassland conservation and as such is a task force member of the International Union for Conservation of Nature's Temperate Grasslands Conservation Initiative (South African contact).

Greg Martindale is the Biodiversity Stewardship Programme manager for Ezemvelo KwaZulu-Natal Wildlife, a conservation authority in South Africa. Greg leads a team of dedicated facilitators who broker and manage the biodiversity stewardship process with landowners in the province of KwaZulu-Natal.

REFERENCES

Bertzky, B., Corrigan, C., Kemsey, J., Kenney, S., Ravilious, C., Besançon, C. and Burgess, N. (2012). Protected Planet Report 2012: Tracking progress towards global targets for protected areas. IUCN, Gland, Switzerland and UNEP-WCMC, Cambridge, UK.

Britton, P. (2010). A report on the application of the METT-SA Version 1 (2008) to terrestrial protected areas managed at national and provincial level in South Africa. Unpublished report for the Department of Environmental Affairs, Pretoria.

CapeNature (2009). Stewardship Operational Procedures Manual. Unpublished internal operations manual.

Carbutt, C. and Escott, B. (2010). KwaZulu-Natal protected area expansion strategy and action plan (2009 to 2028). Ezemvelo KwaZulu-Natal Wildlife unpublished report, Pietermaritzburg.

Carbutt, C. and Goodman, P.S. (2010). Assessing the Management Effectiveness of State-owned, Land-based Protected Areas in KwaZulu-Natal. Ezemvelo KwaZulu-Natal Wildlife unpublished report, Pietermaritzburg. pp. 1-67.

Carbutt, C. and Goodman, P.S. (2013). How objective are protected area management effectiveness assessments? A case study from the iSimangaliso Wetland Park. *Koedoe* 55(1), Art. #1110, 8 pages. http://dx.doi.org/10.4102/koedoe.v55i1.1110.

Carbutt, C., Tau, M., Stephens, A. and Escott, B. (2011). The conservation status of temperate grasslands in southern Africa. *Grassroots* 11(1): 17-23.

CBD (2012). Strategic Plan 2011-2020 – Aichi Targets. www.cbd.int/sp/targets accessed on 30-04-2013.

CEPF (2012). Critical Ecosystem Partnership Fund (www.cepf.net), accessed 26 August 2012.

CI Southern African Hotspots Programme and SANBI (2010). Ecosystem profile: Maputaland-Pondoland-Albany Biodiversity Hotspot. Critical Ecosystem Partnership Fund. pp. 1-135.

Driver, A., Sink, K.J., Nel, J.N., Holness, S., Van Niekerk, L., Daniels, F., Jonas, Z., Majiedt, P.A., Harris, L., and Maze, K. (2012). *National Biodiversity Assessment 2011: An assessment of South Africa's biodiversity and ecosystems. Synthesis Report*. (South African National Biodiversity Institute and Department of Environmental Affairs, Pretoria).

Dugmore, H. (2010). South Africa's first Protected Environment declared. WWF-South Africa, unpublished press release.

Ezemvelo KwaZulu-Natal Wildlife (2008). *KwaZulu-Natal Biodiversity Stewardship Operations Manual (Version 2).* Ezemvelo KwaZulu-Natal Wildlife, Pietermaritzburg. pp. 1-172.

Ginsburg, A. (2013). Grasslands Programme Sustainability Planning Report. Unpublished report for the SANBI's Grasslands Programme. pp. 1-86.

Ginsburg, A., Stephens, A., Tau, M. and Botts, E. (2013). Biodiversity mainstreaming in South Africa's production landscapes: lessons and achievements. Draft keynote paper prepared for the 22nd International Grassland Congress, Sydney, Australia, 15 - 20 September 2013.

Henwood, W.D. (1998a). Editorial – the world's temperate grasslands: a beleaguered biome. *Parks* 8(3): 1-2.

Henwood, W.D. (1998b). An overview of protected areas in the temperate grassland biome. *Parks* 8(3): 3-8.

Henwood, W.D. (2006). *Linking the World's Grasslands: Enhancing International Cooperation for Protection and Conservation of the World's Temperate Grasslands*. IUCN and WCPA, Gland, Switzerland.

Henwood, W.D. (2009). Temperate grasslands of the world: The legacy of Churn Creek - local action goes global. *British Columbia Grasslands* (winter edition 2008/2009): 5 -7.

Henwood, W.D. (2010). Toward a strategy for the conservation and protection of the world's temperate grasslands. *Great Plains Research* 20: 121-134.

Mark, A.F. (2012). Recent progress with the conservation and protection of temperate indigenous grasslands in New Zealand. *Parks* 18(1): 1-11.

Mark, A.F. and McLennan, B. (2005). The conservation status of New Zealand's indigenous grasslands. *New Zealand Journal of Botany* 43: 245-270.

Mark, A.F. and Dickinson, K.J.M. (2008). Maximizing water yield with indigenous non-forest vegetation: a New Zealand perspective. *Frontiers in Ecology and the Environment* 6: 25-34.

Martindale, G. and de Frey, W. (2011). Gauteng Protected Area Expansion Strategy. Sustainable Innovations, unpublished report. pp. 1-55.

Matatiele Local Municipality (2009). Matatiele Local Municipality Annual report 2008/2009.

Meadows, M.E., and Linder, H.P. (1989). A reassessment of the biogeography and vegetation history of the southern Afromontane region. In: Geldenhuys C.J., editor. *Biogeography of the Mixed Evergreen Forests of Southern Africa.* Pretoria, Foundation for Research Development. p. 15-29.

Meadows, M.E. and Linder, H.P. (1993). A palaeoecological perspective on the origin of Afromontane grasslands. *Journal of Biogeography* 20: 345-355.

Morris, B. and Corcoran, B. (eds). (2009). Mpumalanga Protected Area Expansion Strategy (2009-2028). Mpumalanga Tourism and Parks Agency. pp. 1-33.

Mucina, L. and Rutherford, M.C. (eds). (2006). *The Vegetation of South Africa, Lesotho and Swaziland*. Strelitzia 19. SANBI, Pretoria.

O'Connor, T.G. (2005). Influence of land use on plant community composition and diversity in Highland Sourveld grassland in the southern Drakensberg, South Africa. *Journal of Applied Ecology* 42: 975-988.

O'Connor, T.G., Kuyler, P., Kirkman, K.P. and Corcoran, B. (2010). Which grazing management practices are most appropriate for maintaining biodiversity in South African grassland? *African Journal of Range and Forage Science* 27 (2): 67-76.

O'Connor, T.G., Martindale, G., Morris, C.D., Short, A., Witkowski, E.T.F. and Scott-Shaw, C.R. (2011). Influence of grazing management on plant diversity of Highland Sourveld grassland, KwaZulu-Natal, South Africa. *Rangeland Ecology and Management* 64(2): 196-207.

Olivier, W. (2012). The South African National Biodiversity Stewardship programme: progress and challenges. Oral paper presented at the Symposium of Contemporary Conservation Practice, Howick, KwaZulu-Natal on 24 October 2012.

Peart, B. (2008a). *Compendium of Regional Templates on the Status of Temperate Grasslands Conservation and Protection*. Vancouver, Canada: IUCN WCPA.

Peart, B. (2008b). *Life in a Working Landscape: Towards a Conservation Strategy for the World's Temperate Grasslands*, Vancouver, Canada: IUCN WCPA.

Reyers, B., Nel, J., Egoh, B., Jonas, Z. and Rouget, M. (2005). *National Grasslands Biodiversity Programme: Grassland Biodiversity Profile and Spatial Biodiversity Priority Assessment*. Report for the South African National Biodiversity Institute's National Grasslands Biodiversity Programme.

SANBI (2008). South Africa: production sector reform saves ecosystem services. In: *Biodiversity Delivering Results.* GEF/UNDP. pp. 22-23.

SANBI (2014). Biodiversity sector messaging strategy document (2012-2015). GEF/UNDP. pp. 1-14.

SANBI and DEA (2013). Mainstreaming biodiversity: key principles from the Grasslands Programme. GEF/UNDP. pp. 1-21.

SANBI and DEAT (2008). South African National Protected Area Expansion Strategy (2008 - 2012): A framework for implementation (unpublished draft copy).

Stephens, A. (2009). Making biodiversity stewardship work (South Africa). *British Columbia Grasslands*, (winter edition 2008/2009): 32-34.

Tau, M. and Stephens, A. (2012). Making the case for the biodiversity in South Africa: harnessing the value of the Grassland Biome. Oral paper presented at the Symposium of Contemporary Conservation Practice, Howick, KwaZulu-Natal on 22 October 2012.

TGCI (2010a). Temperate Grassland Conservation Initiative Newsletter 4, July 2010. c/o 2429 Kilmarnock Crescent, North Vancouver, British Columbia, Canada.

TGCI (2010b). Temperate Grassland Conservation Initiative Newsletter 5, November 2010. c/o 2429 Kilmarnock Crescent, North Vancouver, British Columbia, Canada.

TGCI (2011). Temperate Grassland Conservation Initiative Newsletter 6, November 2011. c/o 2429 Kilmarnock Crescent, North Vancouver, British Columbia, Canada.

TGCI (2012). Temperate Grassland Conservation Initiative Newsletter 8, November 2012. c/o 2429 Kilmarnock Crescent, North Vancouver, British Columbia, Canada.

UNEP-WCMC (2008). *State of the World's Protected Areas: an Annual Review of Global Conservation Progress*. UNEP-WCMC, Cambridge, UK.

RESUMEN

El frágil estado de los pastizales templados autóctonos a escala mundial ha motivado acciones tales como la Iniciativa para la conservación de pastizales templados de la Comisión Mundial de Áreas Protegidas de la Unión Internacional para la Conservación de la Naturaleza. Empero, si bien esta iniciativa eleva el perfil de la conservación de los pastizales templados en la agenda mundial de la conservación, aún así se requiere de intervenciones a nivel de país emprendidas por las autoridades locales de conservación, en colaboración con las organizaciones no gubernamentales (ONG), para mejorar los niveles de protección sobre el terreno. A este fin, informamos sobre los avances logrados con respecto a la conservación de los pastizales templados autóctonos en Sudáfrica desde 2006, un hito que marca el nacimiento de la gestión de la biodiversidad en nuestro bioma de pastizales templados. Desde entonces, 124.983 hectáreas adicionales de pastizales templados han sido puestas bajo protección formal con más de 96.641 hectáreas en proceso de declaración, la mayor parte de las cuales deberían estarlo para finales de 2014. También se examinan las fuerzas motrices que sustentan estos logros – a saber, el Programa de Pastizales del Instituto Nacional de Biodiversidad de Sudáfrica, la Estrategia nacional de ampliación de áreas protegidas, las unidades provinciales de gestión de la biodiversidad y el financiamiento canalizado hacia la sociedad civil a través del Fondo de Alianzas para los Ecosistemas Críticos para aumentar el aporte estatal. Dadas las ventajas evidentes derivadas de cada intervención, alentamos a otros países con pastizales templados autóctonos a desarrollar estructuras similares para salvaguardar muestras representativas y viables de uno de los biomas terrestres más importantes del mundo.

RÉSUMÉ

Afin de protéger la nature fragile des prairies tempérées indigènes à l'échelle mondiale, la Commission Mondiale des Aires Protégées de l'UICN à lancé l'Initiative de Conservation des Prairies Tempérées. Cette initiative a mis en exergue l'urgence de la protection de ces prairies sur l'agenda mondial de la conservation, toutefois des interventions de la part des autorités locales de conservation, en collaboration avec les organisations non-gouvernementales (ONG), doivent encore être exigées afin d'améliorer le niveau de protection sur le terrain. A cet égard, nous citons les progrès réalisés depuis 2006 pour la conservation des prairies indigènes tempérées en Afrique du Sud, qui ont ouvert la voie à une réelle gestion de la biodiversité dans le biome des prairies tempérées. En effet depuis lors, 124 983 ha supplémentaires de prairies tempérées ont été mis sous protection officielle, et 96 641 ha sont en cours d'évaluation, la plupart devant être accrédités d'ici la fin 2014. Nous discutons aussi des forces motrices qui sous-tendent ces acquis - à savoir le programme en faveur des prairies de l'Institut National de la Biodiversité en Afrique du Sud, la Stratégie Nationale d'Expansion des Aires Protégées, les associations locales de gestion de la biodiversité, et les fonds qui transitent par le Critical Ecosystems Partnership Fund vers la société civile afin d'accroître la contribution de l'Etat. Compte tenu des avantages tangibles issus de chaque intervention, nous encourageons les autres pays qui possèdent des prairies tempérées indigènes à développer des structures similaires afin de préserver ces parcelles représentatives et viables de l'un des plus impressionnants biomes terrestres.