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Conserving Biodiversity on South Africa's Privately-Owned Grasslands: Farmer Experiences with Protected Areas

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Abstract

South Africa's Biodiversity Stewardship Initiative and Protected Areas Act are programs designed to help protect threatened species and provide other conservation benefits. Private grasslands are an important priority for conservation. This project uses in-person surveys to assess the experiences of grassland farmers who have enrolled land as a Protected Area. Primary motivations include conservation; concerns about local mining activity; and other reasons, including potential financial benefits and intergenerational concerns. Farmers typically find that the required management plan helps them improve their grazing and makes their operation more sustainable, and creates conservation improvements. About two-thirds of the farmers who joined at least in part to prevent mining thought that the program had been effective in that regard. Farmers do not feel that the program has resulted in any adverse effects on their operation, and are happy to recommend the program to others. Many of them do have concerns about a lack of ongoing support for their stewardship activities, especially those farming in Mpumalanga Province.

Keywords: Land Conservation, Environmental Management, Natural Resources

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Introduction

Nations are increasingly emphasizing conservation on private lands as an efficient way to meet various ecological goals in a cost-effective manner. Policies such as conservation easements and ecosystem services payments allow the owner to continue to use the land for private purposes while simultaneously ensuring the continued provision of public benefits such as carbon sequestration, protection of water supplies, and habitat for threatened and endangered species (Gloss et al. 2019). These programs can be quite cost-effective compared to public acquisition of additional land to provide these benefits. Challenges include making sure that the program enrolls parcels that provide appropriate benefits and ensuring that proper stewardship occurs so that the conservation values of the property are enhanced, or at least protected, by the private owners.

South Africa has developed an ambitious program called the Biodiversity Stewardship Initiative to protect the country's very diverse array of species. A core piece of the program is the Protected Areas Act, which can assist private landowners who own properties that are in pristine or near-pristine condition and contain an appropriate level or type of biodiversity. Landowners who choose to enter the program agree to follow the terms of a management plan, which includes surrendering the rights to develop the property for the term of the agreement.

Farmers represent an important group of landowners in South Africa. In many cases, significant portions of their farms are used for grazing but have not otherwise been disturbed by plowing or other forms of development. These portions of the farm frequently provide habitat for a variety of species for which conservation is a high priority. Enrolling farmers in this program requires convincing them that the benefit they will receive from the program is worth giving up these rights.

A recent survey of South African grassland farmers who participate in the Protected Areas program collected information about their motivations to enroll their property, stewardship activity on the land, help they have received from other parties since enrolling, other benefits they have received, and concerns they have about the process. The results indicate that in general, farmers are very happy with the program, especially with its effect on the quality of their grasslands and the conservation benefits. About sixty percent of the farmers said that one of their motivations was to use the program to prevent new mines from entering their area; two-thirds of those farmers thought the program had done so, while one-third felt that mines were going to enter regardless of the protections offered by the Protected Areas program. There were concerns mentioned about a perceived lack of support for farmers once they entered the program, with these concerns mainly voiced by farmers in the province of Mpumalanga. Almost all farmers, though, were willing to promote the program to other farmers.

In addition to assessing the experiences of the farmers, another goal of the research was to determine whether the farmers who were primarily motivated by the threat of mining were less likely to follow through on their stewardship obligations compared to the farmers motivated by a self-described interest in conservation. The results do not support that hypothesis; other than the concern about mining, both groups of farmers provided very similar answers to questions about their motivations, stewardship activities, and benefits from the program. The responses of the farmers in the mining sample did raise an important policy consideration: to what extent is it reasonable to consider a property to be protected if new activity in the area is allowed to create negative externalities that destroy a significant part of its conservation value?

The Case for Protecting South Africa's Grasslands

South Africa's natural areas are the home of exceptional biodiversity, with nine different terrestrial biomes providing habitat for a wide variety of endemic species. It has the second highest number of endemic plant species of any nation in the world, constituting about two-thirds of the nation's total number of plant species, and is one of the top ten nations in plant species richness. Fifty percent of amphibian species, fifty-two percent of butterfly species, and fifty percent of reptile species in the country are also endemic (SANBI 2019a, 41).

While there is more and more protection of the habitat on which these species rely, a 2018 study found that over 85 percent of threatened species are under-protected (SANBI 2019a, 16). The country has adopted a set of aggressive goals for protecting land as part of a program of biodiversity assessment and conservation. The Department of Environment, Forestry and Fisheries is required to set targets for habitat protection as part of a set of biodiversity conservation strategies.[1] The most recent report evaluated the progress made between 2008 and 2014 on the Phase I goals, which were the targets for the end of that period. Approximately 830,000 hectares of terrestrial land area were officially declared as protected during that seven-year period. However, biodiversity conservation does not just require protecting land; it requires protecting land from each type of ecosystem. Unfortunately, when characterized as the number of individual ecosystems protected, the land protected met just 18 percent of the Phase 1 target for that period (Department of Environmental Affairs 2016, 11). Far more work needs to be done to achieve these targets.

Native grasslands represent the second-largest terrestrial biome in South Africa and the second-most threatened (SANBI 2019a, 70). Seventy-three distinct types of grasslands exist in the country, and they provide habitat for a high number of endemic species (SANBI 2019b, 20). Figure 1 shows the geographic area of the grasslands, found primarily in the eastern half of the country.

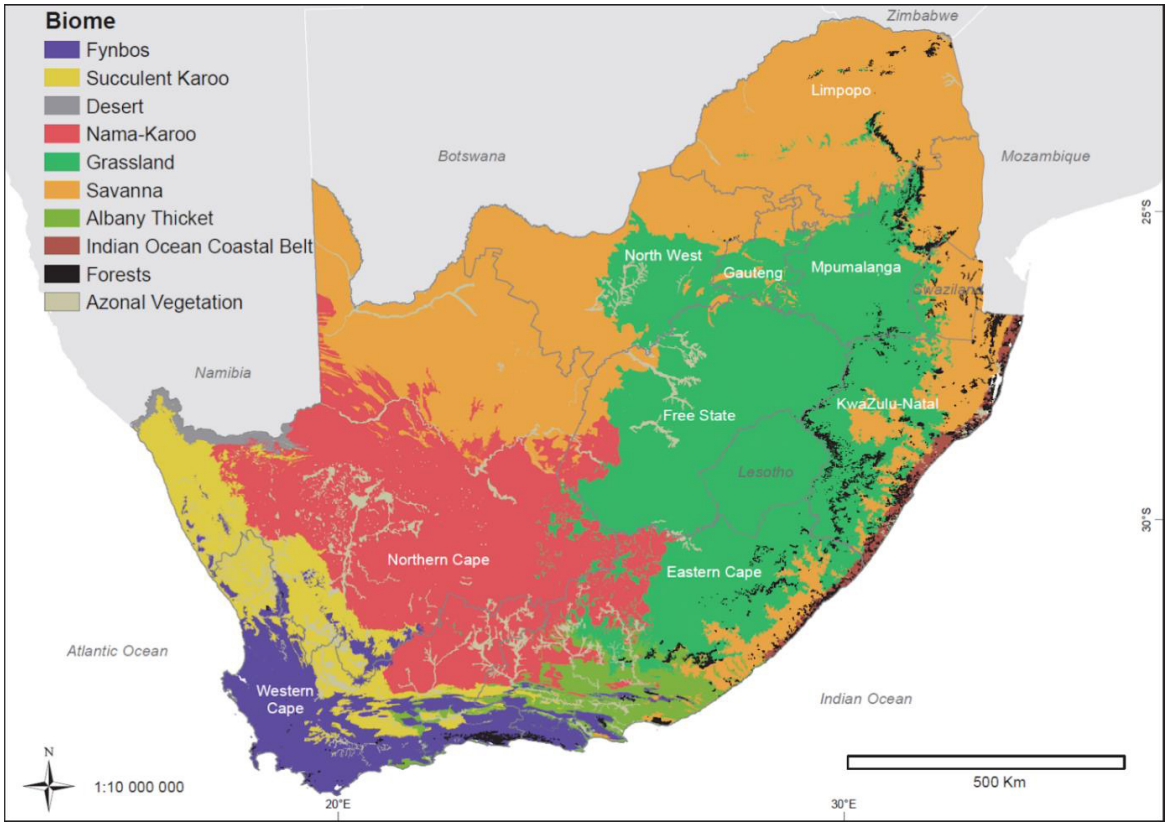
Very little of the grassland biome (or biozone) is protected, leaving much of the area, and many of the distinct types of grasslands, at high risk:

> Grasslands are the second most under-represented terrestrial biozone, with 24 types (33 percent) being classified as Not Protected and 37 types (51 percent) as

[1] The department was previously known as the Department of Environmental Affairs.

Poorly Protected. Few choices exist for meeting protected area targets in Grasslands because of many competing land and resource uses, and there is a need to act quickly to secure remaining options. (Department of Environmental Affairs 2016, 30)

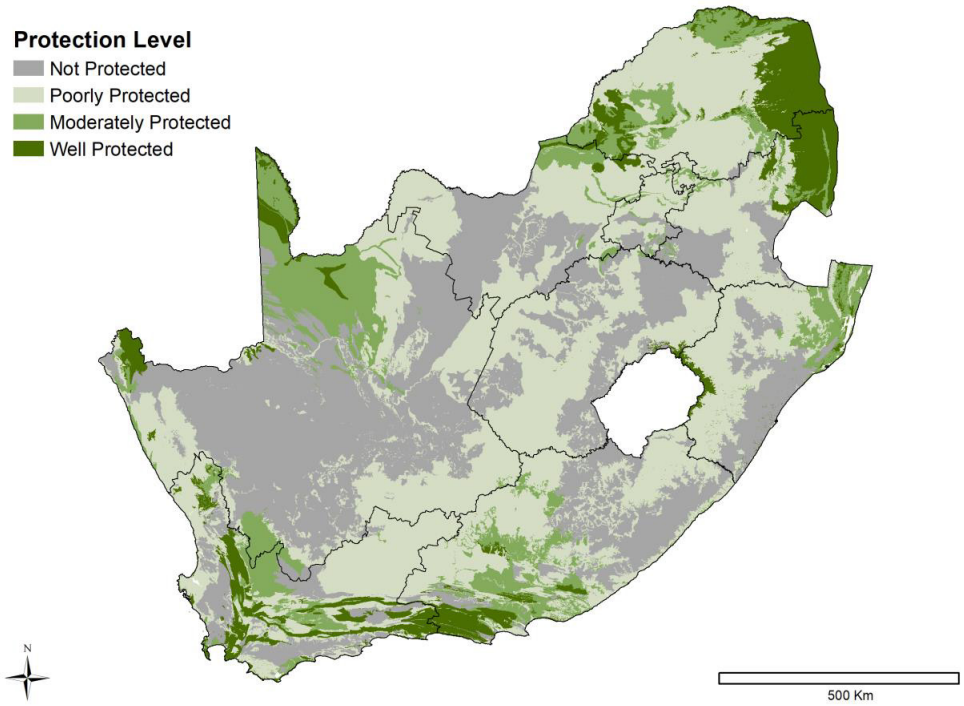
Figure 1: South Africa Biomes



Source: SANBI 2019b, 20

Only 16 percent of the various types of grasslands rate as Moderately or Well Protected, and as Figure 2 clearly shows the total amount of grassland area (all types) protected appears to be far below that figure, with nearly all of the grasslands region seen in Figure 1 rated as either Not Protected or Poorly Protected. Major threats to the grasslands include habitat loss, primarily to planted agricultural crops, plantation forestry, and expanding human settlement; land degradation, often through overgrazing and poor fire management; invasive species; climate change; overharvesting of plants and poaching of animals; and pollution caused by mining and other sources (SANBI 2019a, 71-77). Protecting grasslands, especially portions of the various ecotypes of grasslands, is a high conservation priority, hampered by the heavy private use of these very productive lands.

Figure 2: Protection Level of Terrestrial Ecosystem Types



Source: SANBI 2019b, 114

Conservation on Private Land in South Africa

Like many countries, South Africa recognizes that achieving these goals requires protecting biodiversity on private and communally-owned land, as well as on public land. This continues a very long trend, as documented by De Vos et al. (2019). Their study found that the first official privately protected area (PPA) in South Africa appeared in 1935, with significant growth occurring thereafter. Growth in the number of privately protected areas far exceeded growth in the number of state-owned protected areas during the 1960s and 1990s (De Vos et al. 2019, 5).[2] For the shorter period from 2008 to 2014, 830,000 hectares were declared as protected areas. Over 67 percent of those are either privately owned (60.5 percent) or communally-owned (7.1 percent) land (Department of Environmental Affairs 2016, 9).[3]

There are many reasons to support conservation on private land. The land remains privately held, providing many of the same economic benefits to the owner, and property taxes usually continue to be paid, though perhaps at a lower rate. Leaving the land in private ownership avoids the costs (both monetary and political) of acquiring it. Stewardship costs are often largely paid by owners, rather than by government. Keeping the land in private ownership is also less likely to disrupt the economic base of rural economies (Fairfax et al. 2005; Sundberg and Yang 2012).

[2] While the number of PPAs areas grew rapidly, they are on average much smaller than publicly protected areas, so the acreage protected by each does not show the same trend.

[3] In the remainder of the paper, the terms "landowner" and "privately owned" refer to both individual owners and communal owners, unless otherwise noted.

Several studies have pointed out that publicly owned natural areas often protect habitats that were difficult for early occupants to exploit, and that more economically valuable areas such as grasslands and low-elevation forests are often under-represented in the government portfolio. Conserving high-quality private lands in these areas can provide valuable improvements to biodiversity protection. Emphasizing private conservation of habitat types that are not well-represented in state conservation should be another area of concentration. For example, Gallo et al. (2009) finds that private land conservation in the Little Karoo region of South Africa protects working farms occupying important habitats that are quite different from those protected by public lands.

Many grassland farmers continue to graze cattle and other animals, including sheep and some types of game animals, in relatively natural grasslands that are sometimes in very good condition. With proper grazing and fire management, these grasslands can support livestock, native species of grasses, and much of the other native biodiversity. Habitat improvements can also increase the amount of biodiversity in the area by encouraging certain species to return, making the properties important opportunities for conservation and providing other ecological benefits as well.

One concern about protecting private lands is the extent to which these properties truly conserve the land for the future. Evaluating any policy must also consider factors that might end the protection or reduce the ecological value of the protected parcel. Publicly protected land can be converted to other uses through political processes. Private owners also have opportunities under some policies to remove some or all of the protections that are in place. A study of Australian PPAs found that just of 0.1 percent of agreements with multi-party covenants (contracts in which the landowner transfers certain development rights to another party) had been released. A regional program that allowed landowners to file their own covenants and to extinguish them without approval by another party resulted in a 19 percent release rate (Hardy, et al. 2017).

In South Africa, the final step in protecting private land is to record it in a government gazette. If the owner or the government removes the conservation protections, the land is said to have been degazetted. The study on land protection referred to above found that 6.2 percent of all private nature reserves were degazetted during the study period. Just 2.2 percent of the state-owned reserves were degazetted (De Vos et al. 2019, 5). In order to protect biodiversity in the long term, the legal status of the land must be reasonably well-assured.

In addition, maintaining or enhancing the biodiversity usually requires some kind of ongoing stewardship activity. In the case of grasslands, this often means managing animal use and developing burning regimes that help native grasses outcompete the non-native, invasive grasses. Other invasive species are also likely to require active management. A successful program must somehow develop long-term stewardship on these privately-protected properties.

South Africa's Protected Areas Program

This paper studies what are known as Protected Areas, private or communally-owned lands which are enrolled in a program of biodiversity stewardship.[4] Protected Areas are authorized by the National Environmental Management: Protected Areas Act of 2003, and have been evolving in various ways since then (Department of Environmental Affairs 2016, vii-viii). The Protected Areas Act (PAA) works within the goals of the biodiversity stewardship initiative to encourage landowners to protect and improve the biodiversity on relatively pristine properties across the country. Those actions should simultaneously help achieve other goals of biodiversity stewardship, including climate change mitigation, contributing to the rural economy, and supporting sustainable development (Department of Environmental Affairs 2016, 5-8).

There are three categories of biodiversity stewardship for landowners to consider: Protected Areas, Conservation Areas, and Partnership Areas. Each category provides multiple opportunities, as shown in Table 1. The highest level is the creation of a private Nature Reserve (NR).[5] The next-highest level is the Protected Environment (PE). The PEs often consist of a network of properties owned by different people and are sometimes created as a buffer around the higher-quality NR properties. Only these two highest levels of enrollment qualify as Protected Areas, since landowners agree to more demanding requirements and sign long-term contracts.

Each province runs its own Protected Areas program through a designated agency. Non-governmental organizations including the Endangered Wildlife Trust (EWT), BirdLife South Africa (BLSA) and the World Wide Fund for Nature[6] (WWF-SA) often work with these agencies and with private landowners to help identify appropriate parcels for protection. If the landowner is interested, one or more of the groups will help create censuses of the biodiversity, develop management plans for each landowner, and move through the levels of paperwork with the goal of enrolling all or some of the property as a NR or as part of a PE.

The other categories of Conservation Area and Partnership Area provide opportunities to educate landowners about conservation practices as well as provide some level of short-term conservation protection. The agencies and NGOs often encourage landowners to join one of these programs, with the goal of eventually moving them into one of the Protected Area categories. Groups of landowners sometimes form conservancies where they begin to work together on group projects to protect biodiversity, for example. Some or all of these landowners might eventually choose to increase their commitment by forming a PE.

[4] Department of Environmental Affairs 2016 and SANBI 2017a both provide comprehensive discussions of the history and current processes of the program. Stevens 2019 provides a shorter overview and a discussion of private land ownership patterns.
[5] Private National Parks have a similar level of protection as Nature Reserves, but are administered differently and are not discussed in this study.
[6] Formerly the World Wildlife Fund.

Table 1: Biodiversity Stewardship Program Categories

Type of Agreement	Agreement Duration	Binding Restrictions	Characteristics
Protected Areas			
Nature Reserve, Private National Park	30-99 years or in perpetuity	Protected area declaration, title deed restriction on future owners	Highest level of protection for areas with highest quality of habitat
Protected Environment	30 or more years	Protected area declaration, optional title deed restriction	High level of protection, with more activities allowed than Nature Reserve
Conservation Areas			
Biodiversity Management Agreement	5 or more years	Less restrictive than a protected area declaration	Lower level of protection, requires a management plan
Biodiversity Agreement, other programs	Various terms	Less restrictive than a protected area declaration	Various terms
Partnership Areas			
Conservancies, other examples	None	No formal agreements	Some support provided for biodiversity conservation

Sources: SANBI 2017a, 2018

The process of declaring a Protected Area has numerous steps and can take several years to complete (SANBI 2018, 36-43). Once a landowner has agreed to proceed or has independently expressed interest in the program, the provincial agency or NGO will begin biodiversity assessments to determine the ecological value of the site, as well as a socioeconomic assessment to examine long-term economic viability of the project and the area. The landowner's objectives for the land are also considered. The agency, the landowner, and potentially other organizations will then collectively develop a management plan for the property that will specify particular actions that landowners need to take, such as removing particular invasive species. It will also specify particular actions that cannot be taken, such as converting native grasslands into plowed crop fields. The plan is designed to protect the most important biodiversity categories present, while also taking into account the various socioeconomic factors that affect the viability of the owner's operation.

Landowners then negotiate a contract that specifies the level of protection and the final terms of the management agreement. For NRs, the length of term is a minimum of 30 years, but ideally either 99 years or in perpetuity, depending on the rules of the particular province. PEs are expected to have a term of at least 30 years. NR status also requires that the title have a legal

endorsement, ensuring that the Protected Area obligations transfer to any new owner if the property title is transferred. PE status encourages, but does not require, such an endorsement.

The process for declaring a protected area on communally owned or occupied land has some differences, owing to the nature of ownership and typical needs. In this case, the purpose expands to help with rural economic development, including job creation and reduction in poverty, as well as the usual goals of protecting biodiversity, adapting to climate change, and so on. Management actions might emphasize removal of invasive plant species, for example, with an additional emphasis on job creation and training for community members.[7] There are also no requirements for title deed endorsements, since the title typically remains with the government or in an approved trust (SANBI 2018, 58-60). As a result, title deeds frequently do not exist.

Once the agency and landowner agree to the terms, there is a public comment period for outside parties. The program also creates a buffer area around these properties, and land use restrictions are imposed on landowners in that buffer. This process allows those landowners to object before the areas are protected. In many cases, land use changes in the buffer area are not expressly forbidden, but may be subject to a much more stringent approval process than would otherwise exist. For example, a private landowner adjoining a NR may have to file an environmental impact statement when seeking approval for a new land use, instead of the usual less-demanding permit application with a higher chance of approval. In other cases, those land use changes are already impossible because of other regulations previously in place.

After the land is proclaimed as a Protected Area, landowners are expected follow the management plan for the property. There may be offers of help, such as subsidized or free herbicide to assist with invasive species control. Government groups like Working for Water or Working for Wetlands are often available to help landowners with projects of mutual interest. Provincial and NGO employees may be available to offer advice. Each property is to be audited annually to ensure that the management plan is being followed. These audits might include biodiversity surveys, grassland assessments, evaluation of stocking rates, and other checks as needed. Management plans are to be revisited every five years, so they can reflect accomplishments and address new conditions as appropriate.

The amount of land in protected areas has risen dramatically since 2008, when the Department of Environmental Affairs published its first National Protected Area Expansion Strategy. During the years 2008 to 2019, designated agencies created 189 NRs, protecting nearly 750,000 hectares as shown in Table 2. Thirty-four PEs were created, with over 700,000 hectares protected.

The history of private NRs in South Africa dates back to 1935, and they have been declared under a variety of different policies so they should not all be considered to provide the same level of protection.[8] The median for PEs is more than five times that of the NRs because PEs

[7] SANBI 2018, 62-63 presents a brief case study of a community using this process to determine how to best use a new property for the benefit of both biodiversity and income generation and distribution.

[8] Conservation organizations in South Africa indicate that these historical records are gradually being updated to reflect current conditions. In numerous cases, visits to historic nature preserves have found the land converted to other uses, sometimes decades earlier. As a result, the data prior to 2008 overstate the actual amount of land permanently protected as nature reserves by an unknown amount.

usually include parcels from multiple owners in the same area. For example, the Chrissiesmeer Protected Environment contains 57,500 hectares of property spread across more than sixty farms. NRs are much more likely to be entirely contained within property held by one owner. In other cases, a NR is a portion of private property that adjoins a publicly protected area or connects other protected areas, making it more ecologically valuable than a small parcel might appear to be on paper.

Table 2: Protected Area Creation, 2008–2019

	Nature Reserves	Protected Environments
Number Created, pre-2008	1,214	4
Number Created, 2008-19	189	34
Hectares Protected, pre-2008	3,376,134 ha	76,696 ha
Hectares Protected, 2008-19	743,989 ha	717,499 ha
Parcel Mean, 2008-19	3,936 ha	21,103 ha
Parcel Median area, 2008-19	1,204 ha	6,876 ha
Largest Parcel, 2008-19	89,651 ha	275,074 ha
Smallest Parcel, 2008-19	1 ha	40 ha

Source: Department of Environment, Forestry and Fisheries 2020, author's calculations.

As noted earlier, the cost of protecting private land should be far less than the cost of purchasing the land for a publicly protected area. This has definitely been the case for the biodiversity stewardship program. One study of projects found that purchasing property in the Western Cape cost an average of 73 times the cost of establishing a Protected Area on private land. The same calculation for projects in KwaZulu-Natal estimated that ratio to be approximately 435 to 1. Calculations of post-proclamation management costs found ratios of 4 to 1 and 17 to 1 in the same provinces when comparing the cost of government stewardship to the cost of government support for private stewardship (SANBI 2017a, Ch. 5).

There is a process available for withdrawing the protected status of a land parcel (SANBI 2018, 50). A search for documentation of land withdrawn from this program did not find any examples. However, conversations with knowledgeable people involved with the program indicated there are at least two parcels at some risk of being degazetted in the near future. In each case, the alleged reason is the failure of a landowner to meet important obligations. As a result, the degree of permanence of this protection is difficult to assess at this time. If landowners can effectively "opt out" of the program by failing to follow the management plan, it creates a potentially serious moral hazard problem. Heavy fines for non-compliance could reduce the nature of the moral hazard if they make such a strategy costly. Resolution of these cases will provide much better information about the likely permanence of this protection.

Landowner Motivations to Enroll in Conservation Programs

One of the biggest challenges of protecting private land can be persuading private landowners to participate. While it is less expensive for the government to encourage conservation on private land rather than purchasing and maintaining the land itself, enrolling in such a program creates

direct and opportunity costs for the owner. The landowner agrees to give up rights that might be valuable, either to the owner or to a future buyer. The enrollment process may cost the landowner time, legal fees, or other expenses. The program may obligate the landowner to undertake various stewardship activities or management expenses. Landowners must receive some kind of benefits that more than offsets those costs in order to motivate them to participate in the program. These benefits might stem from fulfillment of the landowner's own beliefs or ethic, a system of external compensation, or a desire to have others notice and appreciate their efforts. The biodiversity stewardship program offers a variety of features that interact positively with potential landowner benefits, and therefore provide motivations.

Tax Benefits

Countries may choose to offer tax benefits for the creation of permanent protections such as conservation easements or simply for not developing the land (Sundberg 2014). Tax benefits can include the opportunity to take tax deductions, which reduce taxable income; to claim tax credits used to pay income taxes; or to reduce property taxes paid on parcels meeting certain requirements.

There are three tax benefits potentially available to Protected Area landowners.[9] The first is in Section 17 of the Municipal Property Rates Act of 2004, which states that a municipality may not levy a rate on portions of a reserve, as defined by the Protected Areas Act, under certain conditions (Republic of South Africa 2004, 30). However, the national legislation as written is not definitive, and municipalities have chosen to see it as an option rather than a requirement. Unsurprisingly, most municipalities are unwilling to forgo part of their tax revenues. A few areas, primarily in the Cape provinces, do offer at least some level of exemption. NGOs are working with municipalities to persuade them to encourage land protection by giving at least a partial rates exemption, but this is on a case-by-case basis and progress has been very slow.

The second tax benefit is the Section 37C benefit, which became effective in 2008 and still stands, though with some modification. The landowner can deduct all costs related to declaring a Protected Area and to maintaining the property in accordance with the management plan from their income for tax purposes (Stevens n.d.-b). This can be a significant benefit to property owners who do not use the land to generate income, but those who use the land can already deduct management expenses. Landowner out-of-pocket costs for declaration are minimal, frequently zero, so this benefit is of virtually no value to farmers and wildlife ranchers who use the land for income.

In an effort to help those who enroll land at the highest level of protection, BLSA and other groups proposed a new fiscal benefit, or income tax deduction, for landowners (Lapeyre and Laurans 2016, 31). The new incentive, Section 37D, was inserted into the Income Tax Act and became effective on March 1, 2015. It allows landowners who protect land at the highest level to take a four percent deduction on the value of the land declared. This deduction can be taken annually for 25 years and carries forward in the event that a year's income is not sufficient to use

[9] Information in this section comes from a variety of sources, but primarily an interview with Candice Stevens, formerly with BirdLife South Africa and now the Innovative Conservation Finance Manager with Wilderness Foundation Africa.

the full deduction (Stevens n.d.-a). Despite being relatively new, it has become well-used, due in part to significant outreach and education efforts. Twenty-nine NRs have been created in KwaZulu-Natal since that date. Of those, twenty-one are receiving the tax incentive, seven are involved in some sort of dispute about the validity of the incentive for their property, and one has been ruled ineligible on the basis of a technical violation.[10]

Qualifying for the fiscal benefit requires that the NR is enrolled for either 99 years or perpetuity, depending on provincial requirements, and that the deed has the title endorsement. Some of the Nature Reserves that have qualified appear to be properties protected prior to 2015, but that did not yet have the title endorsement filed. In that case, one could argue that this is not new land under protection, but it is certainly land that is receiving a higher level of protection than previously since the contract will now apply to subsequent owners.

The value of the fiscal benefit will vary greatly among landowners, based on the value of the land protected and on the marginal tax rate paid by the landowner. Table 3 shows the impact of the tax rate and discount rate on the present value of the tax deduction for a property, using an index value of 100. South Africa has a set of progressive tax rates that vary from 18 percent to 45 percent for individuals, trusts, small businesses, and corporations that pay taxes in a given year. Assuming a value of 100, the fiscal benefit allows a deduction of 4 each year for 25 years. Table 3 shows the present value of a series of 25 such annual tax deductions, assuming the taxpayer's rate remains the same over time and that the deduction does not move the taxpayer into a lower rate bracket.

Table 3: Sample Calculation: Present Value of 37(D) Fiscal Benefit

	r = 3%	r = 6%	r = 10.4%	r = 12%
PV of tax deduction	69.65	51.13	35.13	31.37
Tax savings, t = 0%	0	0	0	0
Tax savings, t = 18%	12.54	9.20	6.34	5.65
Tax savings, t = 28%	17.41	12.78	8.80	7.84
Tax savings, t = 45%	31.34	23.01	15.85	14.12

Source: Author calculations

The first row shows the present value of the 25 annual tax deductions, using different discount rates to reflect different degrees of risk. Taxpayer risks include inflation, the possibility that the deduction is disallowed, the relevant tax rate changing because of system changes, and the risk of income fluctuations that either change the rate paid in a particular year or defer deductions to later years. The highest discount rate of 12 percent approximates the current interest rate on South African long-term corporate bonds. The second-highest rate reflects the approximate recent rate on home mortgages over the past several years.

The present value of the fiscal benefit can be anywhere from a high of 31.34 percent of the value of the property to as little as zero, using a nominal interest rate of 3 percent and looking at different possible tax brackets. This is of course a very low interest rate for a twenty-five-year

[10] Personal interview with Candice Stevens, August 23, 2019.

annuity in an economy where corporate bonds currently pay 12 percent. A more realistic discount rate would reduce that present value to 20 percent or less of the value of the deduction.

A private landowner who does not use the NR as a source of primary income and is in a municipality that offers the rates exemption can potentially benefit from all three of these tax advantages, deducting all management expenses and four percent of the property value per year for 25 years from taxable income and avoiding all municipal rates. This could potentially be quite a significant savings compared to trying to maintain the property without NR status. A landowner who uses the land for production can already deduct the management expenses as a business expense. If the municipality does not offer the rates exemption, then proclaiming the area as a NR only provides a somewhat predictable but relatively small stream of potential tax savings. Proclaiming the area as a PE program currently does not generate any tax benefits for that landowner.

Other Forms of Financial Assistance

Landowners can be compensated in various ways for providing ecosystem services (Gloss, Ahmed, and Johnson 2019), and payments can be made either for activities designed to protect biodiversity or for actual observed changes in biodiversity (Boon, Broch, and Meilby 2010; Gibbons et al. 2011). All of these can help compensate landowners for the direct costs and opportunity costs created by the program or reward them for completing particular actions. However, under certain circumstances they also incentivize behavior that does not necessarily accomplish programmatic goals, such as forgoing development on land that does not meet specific ecological standards, or rewarding landowners for things they would have done anyway (or for not doing things they would not have done anyway), therefore creating expenditures without any additional benefits.

Landowners in the Protected Areas program have the opportunity to receive subsidies for activities related to stewardship, notably for the herbicide used on invasive species. They might also qualify to have other groups come in and do invasives removal or wetland restoration. There are also opportunities to apply for mitigation and offset funds to support projects that protect or improve biodiversity. These payments should create incentives for more such projects, and a higher resulting level of conservation.

Support for Current Land Uses

Studies of landowner motivations find strong support for financial incentives among particular types of landowners and in specific programs. They also present considerable evidence for other explanations of landowner participation, as would be expected. One literature review finds that

> [I]n general, landholders respond positively to nature conservation efforts as long as proposed conservation measures are not perceived as a threat to their livelihood in terms of social and economic welfare, long-term objectives for the land and possibly long-term tenure with a notion of retaining land in the family. (Kabii and Horwitz 2006, 12)

Another concern mentioned was the potential impact of the program to operational risks. Reducing the number of management options might increase risk; however, using strategies that reduce land degradation practices, for example, might reduce risk. These and other risks are inherent in the long-term objectives mentioned above.

Moon and Cocklin (2011) surveyed landowners in an Australian program and argued that production landowners (large farmers) were more likely to want large financial incentives and would be willing only to enroll a small portion of their land. They also found that owners who derive income from their land are most interested in programs that are compatible with existing land uses. They may welcome informal education and advising that enhance those uses.

The structure of the biodiversity stewardship program includes all of those factors mentioned. The program is not only compatible with existing land uses; in the case of grazing, it is designed to enhance those uses. A major goal of the management plan is to help improve the quality of the grassland, giving farmers higher-quality inputs for their operation and reducing costs and/or risks, as well as protecting and improving the biodiversity present on the land. The intention is to improve circumstances for all, consistent with including the socioeconomic and ecological considerations in the same plan.

Conservation Benefits

Many farmers indicate that conservation goals provide an important motivation to participate in such programs, even compared to financial incentives. A study of the federal Conservation Restoration Program in the U.S., which pays farmers to take certain marginal lands out of production, found that the value of ecosystem services provided by those lands was more important to farmers than the financial benefit they received. Farmers particularly valued the program's contributions to soil and water conservation, habitat for pollinators, wildlife conservation, and opportunities for hunting (Lute et al. 2018).

One very comprehensive survey evaluated the motivations, benefits, changes, and challenges resulting from completing a conservation easement in the US (Horton et al. 2017). Landowner interviews most frequently mentioned conservation as a motivation, and as a benefit. Financial interests were the second-most common motivation and benefit to having an easement. Biodiversity may be important to landowners for its own sake, in addition to the value of ecosystem services. Personal and family interests and social/community relationships are also important benefits. They may be concerned about protecting land that has been in their family for generations, or they may have just purchased land with the intention of conserving it. Landowners may feel strong cultural ties to a community and want to preserve it for those reasons, as well as others.

One key aspect of landowner motivation is not just their interest in enrolling in a program, but the likelihood that they will follow through on their new obligations. This might involve something as simple as not plowing up a native grassland that is perhaps uneconomical to convert anyway, or something as complicated as developing a new grazing plan or chemical application system. Stroman and Kreuter (2015) investigated the attitudes of easement holders in Texas and found that their motivations for joining the program appeared to be the best predictors

of their stewardship activity. In particular, they found that farmers were more likely to manage the land to enhance their goals. Having conservation goals that are consistent with landowner goals, to the extent that is possible, should ensure better stewardship practices as well as higher enrollment rates. They also argue for having adaptive management rules that can adjusting to changing ecological needs as well as changing farming practices. The joint development of a management plan to reflect both biodiversity and socioeconomic outcomes is well-tailored to meeting this possible motivation. The opportunity to revisit and revise the management plan every five years to adapt to changed conditions is another important aspect of the program.

Some researchers argue to take this a step farther and transform the supposed relationship between farmers and nature. Their concern is that paying for conservation makes it a short-term financial relationship, subject to the vagaries of the market, rather than a long-term commitment. Fischer, Hartel, and Kuemmerle (2012, 171) argue for a transformation strategy that will "empower local communities to self-organize and reconnect with nature in new ways." Another discussion raises a similar idea about harnessing the power of farming social networks to encourage learning, and perhaps to create new social norms (de Snoo et al. 2013, 69), while phasing out short-term payouts.

Several aspects of biodiversity stewardship are consistent with this idea. The landowners in a PE are expected to work on developing, following, and revising the management plan as a group. The short-term programs mentioned earlier, such as Biodiversity Management Agreements and conservancies, are also designed to help farmers work collaboratively on conservation initiatives on their properties. Ideally, these actions will take advantage of and strengthen existing social networks

Horton et al. (2017) highlighted a significant challenge to landowners who were interested in creating a conservation easement for their property. Almost two-thirds of the landowners surveyed described problems or frustrations with the process. Much of the other research previously mentioned in this section also raised this issue. Landowners often find these processes to be complex, confusing, and/or time-consuming, both during the enrollment process and sometimes afterward. Since these surveys talk with landowners who have completed the process, it is easy to anticipate that there might be many other landowners who might have abandoned the process or perhaps never started it as a result of these problems. Reducing these frustrations should be an important goal of any program.

Private Grasslands and Biodiversity Stewardship

Protecting the grasslands requires finding places where significant biodiversity exists and willing landowners agree that protecting it is compatible with sustainable private uses of the land. Two of the most significant grassland opportunities are land used for wildlife ranches and land used for grazing, especially cattle grazing. These two uses take up approximately 70 percent of the country's land surface, and in addition to providing habitat can also "provide ecosystem services like improving water quality, erosion control, and carbon sequestration" (SANBI 2019b, 23).

There is a substantial literature studying farms converted into wildlife ranches used for tourism, hunting, or both. Wildlife ranches by their very nature have strong potential to protect and improve biodiversity, at least among large mammals.[11] Many of these ranches are proclaimed NRs. There are many positive outcomes, such as Nambiti Private Game Reserve, initially a private venture. After a successful land claim, it has become a combined venture between the original reserve managers, community owners, and some private lodge owner/operators. It is a proclaimed NR, achieving the goals of supporting important biodiversity and providing economic benefits to the community owners and private investors (Taylor, Lindsey, and Davies-Mostert 2016, 96–107).

However, numerous studies point out the conflicts inherent in protecting biodiversity while also having significant financial investments in particular species that are important to tourists or hunters. There is often pressure to remove predators from the property in order to protect other wildlife populations. Protection of individual properties for private purposes can lead to a large number of small, unconnected parcels with little value for many terrestrial species and little resilience (Lindsey, Romanach, and Davies-Mostert 2009). Small parcels, such as individual converted farms, are not adequate for the large and varied game populations that are necessary to support ecotourism, and so are often financially unviable (Clements and Cumming 2017; Cousins, Sadler, and Evans 2008). In these cases, wildlife ranches may not provide significant protection to key elements of biodiversity. Clements et al. (2019) argues that privately protected areas used as wildlife ranches are much more valuable in supporting mammal populations if they adjoin state-protected areas. However, those opportunities only exist for a small fraction of private landowners, who may or may not be willing to change their operations.

Another important way to protect biodiversity is to work with farmers, especially those who use most of their land for grazing cattle, providing habitat for other species as well. These farmers often own and use parcels with significant biodiversity that are too small to be ecologically and financially viable for wildlife ventures, and they would often prefer to continue farming. However, little published work examines any economic effects on landowners in the program who continue to farm. One very recent article on the administrative challenges of the Protected Areas program included the following statement in its conclusion: "We acknowledge that a shortcoming of this research is the missing perspective of the landowners engaged in [biodiversity stewardship agreements]" (Wright et al. 2018, 58). The article then referred the reader to two studies, both done before the recent tax incentive expansion and both describing data from landowners in the Western Cape Province.

[11] Carruthers (2008) and Taylor, Lindsey, and Davies-Mostert (2016) provide excellent discussions of the history, economics, and certain ecological effects of wildlife ranching.

The first of these articles (Pasquini et al. 2009) suggested that landowners in the Western Cape region did not expect financial compensation for their land protection but did desire some form of recognition. However, none of those surveyed made their income primarily from farming the land; they were a mix of nature reserves, wildlife ranches, or leisure/ecotourism farms, where such recognition could potentially create a marketing opportunity or some other kind of status.

The second article (Selinske et al. 2015) found that conservation values and love of the land were the strongest motivators for Western Cape landowners. This work did not find any statistically significant support for financial incentives. However, the work occurred before the creation of the fiscal benefit, so the only financial incentive for commercial landowners (the majority of the sample) was the possible rates exemption. A later article used the same data along with studies of two Australian programs and argued that financial incentives might be effective in encouraging landowners to enter programs, but that other motivations were necessary to improve long-term stewardship practices (Seliniske et al. 2017). The question of the importance of financial compensation for farmers remains open, as does much about their experience with the program.

A major concern in discussions of biodiversity stewardship echoes a theme from the broad literature discussed earlier. Researchers and conservation professionals are very concerned about the lack of government support for the program, both during the enrollment phase and after proclamation. Pasquini et al. (2009) and Selinske et al. (2015) both discuss landowner dissatisfaction with post-proclamation support, in the form of visits from extension services and other experts. Both made strong arguments that using protected areas to achieve biodiversity stewardship goals requires a much higher level of support from the provincial agencies.

Other recent research on biodiversity stewardship provides additional support for this same point. The South Africa National Biodiversity Institute has argued that the cost-effective return on Protected Areas discussed earlier justifies a significant investment in personnel in order to achieve the gains necessary to meet the protected areas targets specified by legislation (SANBI 2017a, Ch. 6). Wright et al. (2018) discusses the many administrative actions that are critical to evaluating, proclaiming, and managing protected areas, including working with NGO partners and working with landowners before, during, and after proclamation. The research indicates that funding for personnel is crucial for the extension services that support landowners who are trying to improve the biodiversity on their property while remaining economically viable (58).

Survey Design and Data Collection

This project surveyed landowners in the grasslands region who are familiar with the Protected Areas program about their experiences with biodiversity stewardship in order to fill this knowledge gap. Understanding the motivations of grassland farmers who enroll in the program, the benefits they receive, and the challenges they face should help provincial agencies and NGOs design projects that are beneficial to both landowners and to biodiversity.

This work is a collaboration with colleagues from the EWT, a conservation NGO that works throughout Southern Africa with a special emphasis on protecting endangered species, many of which live in grasslands. The EWT solicited landowners to participate in surveys, with help from

WWF-SA, BLSA, Conservation Outcomes, and other contacts. In most cases, one or more of these organizations had worked with the landowner, since these NGOs frequently help develop the projects along with provincial agencies. This is not to be considered a representative sample of farmers in the program; as with any survey, respondents had to both be asked and to agree to participate in order to be included. However, the experiences of these landowners should certainly provide valuable information to other landowners who might consider enrolling, as well as to the provincial agencies and NGOs that help initiate and support new Protected Areas.

The final sample consists of thirty-two landowners, three representatives of community groups of landowners, and two property managers, both of whom were in charge of the process to enter the program. All of the properties are located in the grassland biome, and thirty-six of them are used to graze herds of cattle. For most, cattle grazing is the primary use of the land. The land sometimes has other livestock, including sheep, ostriches, or other privately owned wildlife species, and most properties include small agricultural fields used for the production of winter fodder for on-farm use. Twelve of the properties have other land uses on site, usually tourist activities such as a guesthouse and other recreational opportunities, including fishing and hunting. For most of them grazing is the primary source of profit, while several used cattle as an income supplement and as a grazing management tool. The only property in the sample without cattle present belongs to a nonprofit educational organization, which uses wildlife as a grazing management tool.

Twenty farmers owned land in one or more PEs and eight owned land in a NR. Several of those farmers were about to enroll a different property in a new PE as well. Three farmers interviewed were in the process of joining a new PE for the first time, and three were just about to complete the process of becoming a NR.

We also surveyed three representatives of Zulu communities. One community owned land registered as a Community Protected Environment. The other two communities owned land with signed Biodiversity Management Agreements, which is the level of protection just below PE. While those two properties do not qualify as Protected Areas, the community experiences are useful information, and much of the process is similar. We felt it was important to have this perspective in the study, and there appear to be very few communal groups who have proclaimed a Protected Area and use it primarily to graze cattle.[12] Their comments are included in the survey data, and also discussed separately.

Surveys were conducted in person by the author. In all but one case, the author was accompanied by an EWT employee who was able to interpret when necessary. Interviews were conducted primarily in English, with three in Afrikaans and three in isiZulu. Over half of those interviewed spoke Afrikaans as a first language, but most were willing to answer in English and answers to the questions indicated excellent comprehension. In all but six cases, surveys took place at the

[12] Current statistics on community involvement in the Protected Areas program were unavailable. Anecdotally, there are quite a few communities with land in the program, but in many cases it is used for tourism purposes and is not relevant to the case of cattle farmers in the grasslands. In some cases, the land was enrolled by previous owners before being purchased by the government and transferred to a community. In those cases, the current owners cannot discuss motivations to enroll, or progress made since enrollment. The EWT is working with several communities that are proceeding toward Protected Area status, but efforts to set up interviews with the groups were unsuccessful.

farmer's residence. Almost every interview took at least an hour, and they frequently lasted nearly two hours.

The survey consisted of a series of open-ended questions about motivations to enroll, the experience with the process, changes to land use resulting from the management plan, external assistance after proclamation, benefits from the program, and concerns about the program. Interviews were designed as a free-flowing conversation, allowing the farmer to answer questions at great length if necessary and rearranging the questions to fit the flow of the previous answers. In many cases, multiple people were involved in the interview as spouses and other family members, sometimes of different generations, joined in to offer their perspectives.

The interview began by explaining the project's goal of understanding how farmers felt about the program, based on their personal experiences. All landowners were asked about their motivations for deciding to participate in the program, and their feelings about the enrollment process. They were also asked about the requirements of the management plan; those whose land had not yet been proclaimed usually had either seen the final management plan or were in the process of developing it with outside parties, so they could offer their expectations.

Farmers whose properties were already enrolled were asked to discuss specific changes to farming practices and stewardship activities since proclamation, as well as what kinds of external support they had received from the relevant provincial agency or NGOs. They were asked to describe the benefits they felt they received from being a Protected Area, and to mention any concerns or failed expectations that they had. Finally, each farmer was asked if they would recommend the program to other farmers.

Farmers who were still in the process were asked about the changes they expected because of the management plan, their expectations for external support, and any concerns so far, as well as whether they would recommend the program to other farmers. In some cases farmers had already started adopting parts of the management plan into their practices prior to enrollment. These farmers were unable to answer questions referring to post-proclamation outcomes, and so those questions have slightly fewer responses.

Survey responses were recorded during the interview, then sorted into general and more specific groups of responses, approximating the methodology of Horton et al. (2017). Responses on the topics of motivations, stewardship, benefits, and challenges are characterized separately. Motivations were sorted into six categories of response: conservation, mining, financial benefits, community, family, and legal motivations. Each of these categories, with the exception of mining, were further refined into sub-categories. Stewardship responses are categorized as changes to agricultural practices by the farmers and external help received from others. Benefits and challenges represent the third and fourth categories.

Each response was put into one primary category. In the case of motivations, those responses were also put into a subcategory. If there were multiple responses in different subcategories, then each response was also recorded in the primary category. For example, if a farmer stated that conservation was important to protect wildlife, that is one answer coded as both A (conservation) and A3 (biodiversity protection). If the statement said that conservation was important to protect

wildlife and clean water, that was two answers coded as A, one answer for A3, and one answer for A2 (water quality and security).

Mining is a very important issue for land use and biodiversity in South Africa. Mineral rights in South Africa are controlled by the government and administered at the provincial level. The relevant Ministry can accept and authorize prospecting for coal and minerals on private lands. If economically recoverable amounts of material are found, the miners can then file a request to mine. Landowners can choose to sell to the mine, or they can file a lawsuit to deny the mine application. Other parties can also file lawsuits to prevent mine applications on land owned by neighbors.

Mining takes up a relatively small part of the land area of the country but is concentrated in certain areas where it can have dramatic effects. Mining in the grasslands has increased the threat to some endemic species, with the most habitat impact in the provinces of Gauteng and Mpumalanga (SANBI 2019b, 54). For many farmers, concerns about mining can reflect aspects of any, even all, of the other five categories. Complaints about nearby mining activity include the destruction of farmland and wetlands, water pollution, damage to roads from heavy trucks, and damage to buildings and wildlife from blasting. These can be characterized as conservation concerns for the environmental damage they cause; financial concerns, because of their potential harm to farming operations; community concerns, especially where tourism is important; family concerns, in cases where children hope to continue farming on the same property; and legal concerns, since farmers often participate in lawsuits to try and prevent mining. As a result, when a farmer is motivated to join a Protected Area in order to reduce the chance of mining, it could be for one or more of these reasons, so concerns about local mining are categorized as a single motivation.

Two very large PEs (Greater Lakenvlei and Chrissiesmeer, both located in the province of Mpumalanga) are in areas with very high-quality water resources and considerable coal mining activity. Many farmers in these areas immediately responded to the motivation question by saying they joined to fight the mines. Farmers in other areas mentioned coal, fracking, and in one case diamonds as potential mining threats. Farmers who expanded on the answer to discuss mining concerns were coded in multiple categories, as appropriate. For example, the statement “I joined to fight the mines, because we have to protect our clean water and we need help with that” would be coded as B (mining), A (general conservation), and A2 (water quality). It would not count as E (legal), because every response against mining assumed, or at least hoped, that Protected Area status would provide some level of legal protection against mining, both in the Protected Area and in the buffer zone.

In addition to learning more about the experience of farmers in the program, the research tests two hypotheses. The first hypothesis is that farmers who joined a Protected Area to fight local mining projects might have different motivations and/or different stewardship attitudes than farmers who said their primary motivation was to conserve nature or natural processes. As a result, each set of responses is analyzed for statistically significant differences between those who stated that mining was a motivation and those who did not.

Another hypothesis is that farmer attitudes about the successes and concerns of Protected Areas might be different across provinces. Farmers in Mpumalanga were noticeably more skeptical about the ability (or will) of that agency to prevent coal mining in their areas, compared to farmers surveyed in other provinces (primarily KwaZulu-Natal, with twelve responses; surveys were also completed with two farmers in each of Eastern Cape and Free State, and one in Gauteng). Each set of responses compares those of the Mpumalanga landowners to those in the other provinces to test for possible differences there as well.

Survey Results and Discussion

Farmer Motivations

Table 4 provides information about the broad categories of motivations mentioned by the farmers. There were 96 total responses, an average of 2.6 per survey. The leading category was conservation, with an average of 1.2 responses per survey. More than half the landowners stated that mining concerns were a consideration in their decision to join the program. Landowners mentioned other types of possible motivations much less frequently, and often in combination with conservation.

Table 4: Motivations for Participating in Biodiversity Stewardship, Full Sample

Code		# Responses	% of Interviews
A	Conservation	45	122%
B	Mining Concerns	22	59%
C	Financial	9	24%
D	Personal	9	24%
E	Legal	7	19%
F	Community	4	11%
	n = 37 interviews		

Table 5 compares the motivations of those who listed stopping mining as a motivation versus those who did not. Table 6 compares the results for those whose property is located in Mpumalanga compared to those with property in the other provinces. Seventeen of the twenty farmers in Mpumalanga used mining as a motivation for joining the program. Five of the seventeen farmers in other provinces mentioned mining as a motivation. The correlation coefficient between mining concerns and a location in Mpumalanga is 0.564 for the full group of farmers, including those who have not yet had their property proclaimed.

T-tests are used to test for significant differences between means in each sample. None of the differences in responses are significant for those who mentioned mining concerns compared to those who did not; almost every farmer who was concerned about mining offered specific reasons why mining was a problem that corresponded to one of the other categories, and they also offered other motivations.

In many cases, farmers showed evidence of having acquired more conservation knowledge and concern about conservation as they went through the enrollment process, and discussed how their appreciation for what the program might be able to help them accomplish grew as they got closer to finishing the process.

Those concerned about mining did not mention financial concerns any more frequently than those who did not discuss mining; the response did not typically say that they wanted to fight mining because it would wreck their livelihood, for example. It is noteworthy that those who wanted to fight mining were just as likely to offer conservation as a reason to join a Protected Area as those who did not mention mining. For example, one farmer stated:

> The big concern was coal mining. Our biodiversity and the condition of the veldt is pristine, we wanted to conserve it. This area is a big water engine that feeds the Pongola, Vaal, Assegai, and Tugela rivers. The most important goal of a Protected Environment should be to protect biodiversity. [13]

Table 5: Motivations, Controlling for Mining Concern

Code		Mining Concern	%	No Mining Concern	%
		# of Responses	% of Surveys	# of Responses	% of Surveys
A	Conservation	27	123%	18	120%
B	Mining Concerns				
C	Financial	4	18%	5	33%
D	Personal	6	27%	3	20%
E	Legal	3	14%	4	27%
F	Community	3	14%	1	7%
		n = 22		n = 15	
* = percentages are statistically significant at the 10% level ** = " " " " " " 5% " *** = " " " " " " 1% "					

Table 6 does indicate two differences in the groups sorted by province, both statistically significant at the one percent level. One is the level of mining concern; as noted earlier, much of the mining activity occurs in Mpumalanga. The second is the desire for legal help, excluding help stopping mines. Statistics indicate that those in other provinces were much more likely to want the program to offer legal help. However, every farmer in the mining sample was effectively saying that legal help was important to fight mines; they just did not specifically mention legal help in any other areas. Legal help, with mines and in other ways, is clearly a motivating factor for many landowners.

[13] The appendix provides sample comments from many of the surveys for each section of the analysis.

Table 6: Motivations, Controlling for Province

Code		Mpumalanga		Other Provinces	
		# of Responses	% of Surveys	# of Responses	% of Surveys
A	Conservation	25	125%	20	118%
B ***	Mining Concerns	17	85%	5	29%
C	Financial	3	15%	6	35%
D	Personal	7	35%	2	12%
E ***	Legal	0	0%	7	41%
F	Community	2	10%	2	12%
		n = 20		n = 17	

Table 7 breaks the categories other than mining into more narrow groupings to provide additional insight into farmer motivations. The three subcategories most commonly mentioned are all some aspect of conservation, such as a broad statement about nature or ecology, a statement specifically about water, or a mention of the importance of biodiversity.

Nearly half of the responses mentioned the importance of conservation as a general principle, and the same number emphasized the need to protect clean water, for local farming and drinking and for the entire catchment. Farmers frequently discussed their property's role in the environment and in society. One farmer referred to his property as "quite pristine, in one of the last grassland biomes in South Africa and an important water catchment." Several specifically mentioned which cities got their drinking water from rivers fed by water sources on their farms.

Table 7: Narrow Motivations for Program Participation, Full Sample

Code		#	%
A1	General conservation; no specific aspect mentioned	18	49%
A2	Protecting water quality and quantity	18	49%
A3	Protecting biodiversity	9	24%
C1	Protecting or increasing farm revenue	1	3%
C2	Reducing farm input costs	6	16%
C3	Improving nonfarm income	2	5%
D1	Protecting land farmed by previous generations	1	3%
D2	Protecting land for the next generations	8	22%
E1	Gaining access to legal help (needs other than mining)	2	5%
E2	Reducing the likelihood of a successful land claim	5	14%
F1	Reducing negative externalities	1	3%
F2	Creating economies of scale in conservation	0	0%
F3	Strengthening the local economy	3	8%
	n = 37		

The third-highest response had to do with biodiversity. Farmers sometimes mentioned particular species of wildlife that used their property, especially the crane species present. This is partly a

result of the high visibility and iconic status of South Africa's three species of cranes,[14] and partly a sample selection issue, since the EWT has specifically highlighted several of the survey areas as a high priority for crane conservation. Farmers in areas of important crane habitat are much more likely to be contacted by the EWT for possible inclusion in a PE or NR.[15] The farmers often displayed genuine enthusiasm and great knowledge about the cranes, offering updates about how many of which species they had seen recently, and sometimes about other species of concern such as Oribi.[16]

The most common financial motivations mentioned were finding opportunities to reduce input costs. Other groups are often available to help landowners in this area, either as part of the declaration process or afterward. Provincial agencies and NGOs frequently offer information and assistance to landowners seeking grants, remediation offset funds, or government agencies who might provide money or services. The most common example given by far was access to programs that provide help with removing invasive species and wetland restoration. These activities are required by the management plan, but they are also activities that farmers have traditionally done at their own expense, and farmers frequently hoped that entering the program would give them additional resources. For example, the government has a public works program called Working for Water that assists landowners by removing invasive species from wetlands and riparian areas. Working for Wetlands is a similar program that helps stabilize wetland banks to reduce runoff and erosion (Barendse et al. 2016, 6-8). Farmers with protected land are more likely to receive help from these programs compared to landowners who could easily convert their property to some other use.

Several farmers also mentioned that the extension services on grassland management had been a motivation to join the problem. Government agencies and NGOs have provided learning opportunities designed to improve grassland management, often using altered burning regimes and lower stocking rates and based on recent scientific findings. These improved grasslands have a higher proportion of native species of grass and are valuable to other native species. They hoped that improved grasslands would reduce the need for supplemental feeding in the winter, thereby reducing production costs. Those who have or were negotiating NRs frequently mentioned the fiscal benefit, but always with the disclaimer that while it was nice, it was not a reason they signed up for the program.[17] Several farmers said that there had been a mention of a possible rates exemption, but that they had not counted on it and did not ever expect to receive it.

Even though many of the farms included other businesses, mainly based on tourism, very few farmers indicated that improving another business was a motivation. As with tax benefits, they often thought that it might someday generate a little additional money, but did not see that as an important reason to enter the program.

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[14] South Africa is home to the Blue Crane *(Anthropoides paradiseus)*, the country's national bird; the Wattled Crane *(Bugeranus carunculatus)*; and the Grey Crowned Crane *(Balearica regulorum)*.

[15] Other NGOs will work with landowners whose properties serve their particular areas of focus, which might include particular plant communities, areas with high diversity of birds, or other factors.

[16] *Ourebia ourebi*, a small grassland antelope.

[17] Two landowners who were just finishing the Nature Reserve process were surprised to hear during the interview that they could qualify for a tax benefit, and indicated that they would look into it. Two others who qualified and were receiving the benefit said that they didn't hear about the possibility until already well into the enrollment process.

Personal or family ties were important in almost a quarter of the responses. These were almost always mentioned by people who were at least the third generation of the family farming on the land. It was seldom phrased as taking care of a place they had inherited, but instead as trying to make the farm as sustainable as possible so their children could still use it. In at least two cases, children living on the farm were the sixth generation of a family there, and the current farmers were very clear about the importance of leaving their children with something that was at least as good as what they themselves had received.

Legal matters were characterized in two ways. The first category was help with law enforcement or civil suits unrelated to mining. Most farmers suffered significant losses of livestock and wildlife from poaching and theft. Penalties for poaching from a Protected Area are supposed to be higher than the usual penalties, but farmers universally felt that law enforcement did not take poaching complaints seriously. Most of them hoped that their status would result in better enforcement, but they did not expect it and so therefore it was not a motivation for many.

The most common legal reason given was that being in a Protected Area might offer some protection against being subject to a land claim. Protected Area status does not provide any formal protection against claims; there are many examples of Protected Areas redistributed via land claim. However, many farmers mentioned that they felt that some potential claimants would prefer land that did not have such restrictions.[18]

The final category, community, considers reductions in negative external effects to the landowner from others and positive impacts from the landowner to others. There were few mentions of any of these as strong motivations, other than the many concerns expressed about mining. One person mentioned the importance of getting more people in the Protected Environment in order to reduce the spread of invasive species onto land already cleared, and several mentioned some hope that protecting and improving the biodiversity would help the local community get a boost of additional tourism.

Tables 8 and 9 show the frequency of responses for each category for the mining and Mpumalanga sub-groups. Those expressing concerns about mining were less likely to use general environmental quality as a motivating factor, and more likely to specifically refer to the importance of clean water. This is consistent with their frequent claim that mines create water problems that persist into the indefinite future. They were much less likely to mention cost savings as a motivation.

[18] Several farmers said that they thought there were frequent instances of people filing land claims without a strong legal basis, hoping to get compensation in exchange for agreeing to drop the suit. Having this status could discourage those looking for a quick financial settlement, at least in the farmers' opinion.

Table 8: Specific Motivations, Controlling for Mining Concern

Code		Mining Concern: Yes		Mining Concern: No	
		#	%	#	%
A1*	General conservation; no specific aspect mentioned	8	36%	10	67%
A2**	Protecting water quality and quantity	14	64%	4	27%
A3	Protecting biodiversity	5	23%	4	27%
C1	Protecting or increasing farm revenue	1	5%	0	0%
C2**	Reducing farm input costs	1	5%	5	33%
C3	Improving nonfarm income	2	9%	0	0%
D1	Protecting land farmed by previous generations	1	5%	0	0%
D2	Protecting land for the next generations	5	23%	3	20%
E1	Gaining access to legal help (needs other than mining)	1	5%	1	7%
E2	Reducing the likelihood of a successful land claim	2	9%	3	20%
F1	Reducing negative externalities	1	5%	0	0%
F2	Creating economies of scale in conservation	0	0%	0	0%
F3	Strengthening the local economy	2	9%	1	7%
		n = 22		n = 15	

The Mpumalanga sample shows two of the same significant effects as the mining sample, with a much higher likelihood of specifically mentioning the importance of protecting water, and a much lower likelihood of discussing potential savings on farm inputs. None of the Mpumalanga farmers mentioned help with a land claim as a motivation, though the difference compared to other provinces was only marginally significant.

Table 9: Specific Motivations, Controlling for Province

Code		Mpumalanga		Other Provinces	
		#	%	#	%
A1	General conservation; no specific aspect mentioned	9	45%	9	53%
A2**	Protecting water quality and quantity	13	65%	5	29%
A3	Protecting biodiversity	2	10%	6	35%
C1	Protecting or increasing farm revenue	1	5%	0	0%

Code		Mpumalanga		Other Provinces	
C2**	Reducing farm input costs	1	5%	5	29%
C3	Improving nonfarm income	1	5%	1	6%
D1	Protecting land farmed by previous generations	1	5%	0	0%
D2	Protecting land for the next generations	6	30%	2	12%
E1	Gaining access to legal help (needs other than mining)	0	0%	2	12%
E2*	Reducing the likelihood of a successful land claim	0	0%	5	29%
F1	Reducing negative externalities	0	0%	1	6%
F2	Creating economies of scale in conservation	0	0%	0	0%
F3	Strengthening the local economy	2	10%	1	6%
		n = 20		n = 17	

Stewardship: Agricultural Practices

Farmers were asked how their practices had changed as a result of the program. In most cases, respondents initially said that they had always farmed well and they didn't have to change, or didn't have to change much. With a little verbal prodding, it turned out that many of them have made some important changes to their practices as a result of the education offered as part of the declaration process, especially the creation of the management plan, and because of extension courses that were offered post-declaration.

As mentioned previously, a significant part of the management plan is to identify invasive species of plants in key areas for removal. Nearly all of the farmers interviewed said they had been removing invasive plants from their property for a long time, and 86 percent of those surveyed said their efforts had increased since entering the program. They found that the outside experts involved in the process helped them identify invasive plant species of which they were unaware. Farmers also discussed some new plant removal methods they were trying based on the management plan.

Another major part of the management plan is an evaluation of the quality of the grassland. The experts were able to offer advice on different kinds of veldt (grassland) management such as new grazing and burning regimes to help restore the native species of grasses. These expert visits and extension services were often much more helpful than farmers expected when they began the process, and many of them spoke very enthusiastically about what they had learned and how they had put it into effect.

Table 10: Stewardship: Changes to Agricultural Practice, Full Sample

Code		#	%
G1	Changes to grazing practices	24	65%
G2	Changes to burning practices	18	49%
G3	Increasing activity to control invasive plants	32	86%
G4	Other changes	10	27%
G	Total number of stewardship actions	84	227%
	n = 37		

Two-thirds of the farmers mentioned significant changes to grazing practices. In many cases this involved a type of rotational grazing, where pastures are divided into smaller units, or camps, than had previously been the case. The cattle remain in a camp until everything is thoroughly grazed, and then are moved to a new camp. This forces the cattle to eat the invasive grasses, which are less palatable, rather than just eat the native grasses and leave room for the invasives to spread more easily. The rotation allows individual camps to rest for a full growing season every few years, which provides taller levels of grasses that offer cover for other species, an important feature of biodiversity stewardship. Those camps are then available as winter fodder for livestock. Several farmers noted that they had reduced their stocking rates according to the recommendations of the plan, while other said they were grazing more cattle than before.

Half of the sample said that burning practices had changed in ways designed to help the native grasses outcompete the invasive grasses. Several also indicated that their burning practices now did a better job protecting the wetlands. This usually had to do with altering the frequency of the burns to do them less often, and changing the time of year when burning occurs. Other activities mentioned included a switch to fencing that kept livestock contained without impeding access by wildlife, growing native trees in a nursery and giving some to neighbors, reducing soil erosion on hillsides, and reducing the number of roads within the property.

The only significant difference in stewardship practices noted when comparing subgroups is that those with mining concerns (Table 11) were less likely to change their burning practices than the rest of the sample. That same finding held true for the Mpumalanga subgroup (Table 12). Most of those who did not change their practice were from one region in the province where mining is a strong motivation to seek proclamation. Conversations with two grassland experts indicated that farmers in that part of the province tended to have historic burning practices that were unusual, but seemed to be working well based on the results of the grassland surveys. The management plan did not list changes to the burn plan as a high priority since the condition of the grasslands was so good.

Table 11: Stewardship, Controlling for Mining Concern

Code		Mining Concern		No Mining Concern	
		#	%	#	%
G1	Changes to grazing practices	13	59%	11	73%
G2*	Changes to burning practices	8	36%	10	67%
G3	Increasing activity to control invasive plants	18	82%	14	93%
G4	Other changes	7	32%	3	20%
G	Total number of stewardship actions	46	209%	38	253%
		n = 22		n = 15	

Table 12: Stewardship, Controlling for Province

Code		Mpumalanga		Other Provinces	
		#	%	#	%
G1	Changes to grazing practices	12	60%	12	71%
G2**	Changes to burning practices	6	30%	12	71%
G3	Increasing activity to control invasive plants	17	85%	15	88%
G4	Other changes	7	35%	3	18%
G	Total number of stewardship actions	42	210%	42	247%
		n = 20		n = 17	

In general, farmers knew what stewardship was required and described what they were doing. They were often quite enthusiastic about the various changes proscribed by the management plan and the extension classes, including how it educated them about their interactions with nature. As one farmer said, “The positive thing is that it made you think twice about what you do. You realize that orchids and frogs are important.”

Stewardship: External Assistance

One of the motivations farmers mentioned for joining the program was the opportunity to have external help after proclamation. The twenty-nine respondents enrolled in the program for at least a year listed the ways they have received external help, categorized in Table 13. The biggest two areas of external help have involved invasive species removal. Working for Water, mentioned earlier, is a public works program that does a lot of work in Protected Areas, primarily in removing invasive trees from watercourses. There was some dissatisfaction with this work, which others suggest might be the result of poor communication about the farmers’ expected role in follow-up prevention (Barendse et al. 2016, 6-8), but all agreed it was valuable on some level. Other farmers were grateful for receiving free or subsidized herbicide from the government and grants that compensated them for some of their own labor costs in removing invasive species.

Stewardship help can also include assistance in identifying and applying for different grant opportunities. One source of money is remediation and offset funds, which become available when a firm needs to protect biodiversity in an area because of damage it has done elsewhere. Farmers who had not received mitigation money mentioned beneficial projects nearby using those funds. Qualifying for these funds requires a very strong and long commitment to biodiversity stewardship; one successful farmer mentioned he thought it had taken more work to qualify as an offset site than as a NR. However, that money has allowed farmers to take on some significant projects like wetland restoration and other special investments to increase biodiversity on their property.

Though these landowners often expressed the opinion that they should not receive tax benefits (sometimes referring to them as government handouts) for protecting their land, many of them did appreciate other forms of targeted assistance, either financial or in-kind, designed to help them make significant changes to their property or land use. There are also other types of assistance, including small grants or programs paying for specific improvements. Farmers can receive follow-up visits from experts who offer additional advice about ways to improve grasslands, point out unnoticed species of invasives, do biodiversity surveys, and so on. Farmers were also extremely grateful for the administrative and legal help that nonprofit groups provided.

Table 13: External Stewardship Help, Full Sample

Code		#	%
H1	Working for Water	8	28%
H2	Financial help for herbicide purchases	8	28%
H3	Working for Wetlands	3	10%
H4	Mitigation, offset, or other external grants	1	3%
H5	Other help	10	34%
H	Total responses	30	103%
	n = 29		

The percentages for the subgroups are not presented in this category, since there were no statistically significant differences at the 1% or 5% level. The farmers with mining as a motivating factor were less likely to receive help for herbicide purchases, but the difference is only significant at the 10% level.

Farmer Benefits

Overall, the farmers surveyed felt that they had received significant benefits from being a PE or NR, with many positive comments about outcomes to date. They listed an average of 2.5 benefits per interview, and provided approximate numerical estimates of some of the benefits, usually in terms of agricultural output gains or input reductions. The benefits mentioned relate mainly to new farming practices, protection against mines, and improved conservation. Landowners in the oldest Protected Areas tended to describe the most dramatic improvements. Farmers in newer areas indicate that they understand these improvements will take time to occur, but that they are quickly seeing small improvements, especially in the quality of their grassland. Other aspects of

conservation such as increased wildlife population take much longer to improve and so were less frequently mentioned as a clear benefit by people with just a few years in the program.

They attribute many of these improvements to following the new practices indicated in the management plan. In some cases, they credit the plan directly, and in others they refer to the improved grazing available for their cattle that results from following the plan. Several farmers talked about intentions to double or even triple their herd on the same ground because of continuing improvements in the grasses, while another said he was reducing his stocking rate but making up for it with better grass and much better reproduction rates. Over one-quarter of respondents said that they thought their operation had become more sustainable because of the changes they made. Farmers were quite passionate about their grassland improvements in some cases. One common theme was that they had followed the advice of the grassland expert who visited earlier, and they hoped he would come back so they could show him how much better things had gotten.

Farmers also credited the management plan with helping protect or improve wildlife populations, especially in the older PEs, and sometimes commented on seeing different species of wildlife than previously. Others talked about the improved wetlands, which frequently were the result of stewardship activity such as removing invasives.

The most common single response was the perceived effect of the program on preventing local mining activity. Farmers occasionally credited this as protecting water quality, which some mentioned specifically, along with other associated benefits. When farmers said they were motivated to join the program because keeping out mines would protect biodiversity, that was counted as two separate motivations. When a farmer said that a benefit had been protection against mines, it was only counted as one unless the farmer specifically stated that it had therefore also protected biodiversity. In many cases, the associated benefits of keeping mines out were not mentioned again since they had been listed earlier in the conversation. It is also much easier to quantify the lack of additional mining activity in recent years compared to any changes in biodiversity compared to what might have happened had mining activity increased. This suggests that this method undercounts the actual number of benefits received.

Table 14: Benefits from Program Participation and Stewardship, Full Sample

Code		#	%
J1	Improved grazing for cattle	13	41%
J2	Program help against mining activity	15	47%
J3	Reduced negative externalities (non-mining)	2	6%
J4	Operation is more sustainable (unspecified)	9	28%
J5	Protected and/or improved wildlife populations	4	13%
J6	Protected and/or improved wetlands/water quality	5	16%
J7	Tax benefits	7	22%
J8	Detailed management plan	12	38%
J9	Other benefits	15	47%
J	Total responses	81	253%
	n = 32		

Farmers were asked about other possible economic benefits of having land in the program. Several of those who owned guesthouses were convinced that having a protected area on or near the property made it more attractive to tourists. Others spoke about additional opportunities for tourism in the general area, if not on their property. One PE had just received large road signs announcing the area during the second set of interviews, and landowners there were optimistic about an improvement in tourism as a result.[19]

In addition, several farmers told us about the benefits of Protected Area enrollment for product certifications. One such certification is the Responsible Wool Standard, in which two of the sheep farmers interviewed participate. They found that most of the required paperwork and management actions for that certification had already been completed as part of the Protected Area enrollment process and were delighted to describe how easy it was to finish what had seemed like a mountain of paperwork. As one of them said, "Farmers hate paperwork, and here I realized that most of this huge stack of application forms had already been done for the PE!" One of those farmers recently volunteered to make a presentation on RWS to sheep farmers in a PE in a different area, and the president of that farmer's group said that landowners there were becoming more interested in joining the PE as a result. Farmers intended to seek out other certifications for their products, and they expected that the number of such programs would keep rising.

Two farmers also mentioned the benefit of getting neighboring farms and new farmers into the program, citing improvements in nearby grazing and burning practices and a resultant decrease in the number of negative impacts on their own property. They said that the new farmers tended to overgraze, so the cattle eventually broke down fences and ended up in other people's camps, and burns often got out of control and jumped firebreaks, doing damage to other properties. They felt that getting the new farmers to use the lessons of the management plan had really improved the practices and reduced negative impacts on other farms.

Seven landowners reported receiving tax benefits; six of them owned NRs which qualified for the fiscal benefit, and one of them was a NR located in the only area surveyed that offered a rates exemption. Three other landowners also had new NRs, but these were just completing the process and were not included in the post-proclamation portion of the survey.[20]

A comparison of the benefits for the two subgroups found just a few small differences. In the mining sample (Table 15), those who joined the program to fight mining were far more likely to list help against mines as a benefit. Two of those who did not list mining as a motivation also noted that they thought there was more protection. The mining sample was also much less likely to cite improved grazing as a benefit of the program. These farmers were primarily in the same area where burning regimes did not change because the grassland was in good shape, so there probably was no real need to improve what were already high-quality grazing areas.

[19] The production and installation of the signs were paid for by mitigation funds from a large mining corporation, which had done wetland protection work in the area. The corporation was also helping in a lawsuit against a small mining firm trying to mine in an area near those mitigated wetlands, which was much appreciated by the farmers.
[20] One landowner who had a Nature Reserve proclaimed in 2015 did offer his views on other benefits, but didn't mention the Fiscal Benefit. When asked about it, he said he had no idea such a thing existed. He was encouraged to consult a tax advisor.

Table 15: Benefits from Program Participation and Stewardship, Controlling for Mining Concern

Code		Mining Concerns		No Mining Concerns	
		#	%	#	%
J1**	Improved grazing for cattle	5	26%	8	62%
J2***	Program help against mining activity	13	68%	2	15%
J3	Reduced negative externalities (non-mining)	2	11%	0	0%
J4	Operation is more sustainable (unspecified)	7	37%	2	15%
J5	Protected and/or improved wildlife populations	3	16%	1	8%
J6	Protected and/or improved wetlands/water quality	4	21%	1	8%
J7	Tax benefits	2	11%	5	38%
J8	Detailed management plan	7	37%	5	38%
J9	Other benefits	9	47%	6	46%
J	Total responses	52	274%	29	223%
		n = 19		n = 13	

Table 16 shows the benefits cited by Mpumalanga famers. As above, the perceived reduction in mining activity is an obvious difference based on the location. The other significant difference is that none of the Mpumalanga landowners received any tax benefits. This is simply because all of the NRs surveyed were in another province (KwaZulu-Natal), so none of the Mpumalanga properties qualified. This is not just a sample selection problem. The Protected Areas Database shows sixty-three NRs created in KwaZulu-Natal alone since 2008, and just nine in Mpumalanga. It would be useful to know to what degree the lack of Mpumalanga NRs is the result of local farmer attitudes versus agency priorities in the province but the surveys did not offer any insights on that topic.

Table 16: Benefits from Program Participation and Stewardship, Controlling for Province

Code		Mpumalanga		Other Provinces	
		#	%	#	%
J1	Improved grazing for cattle	6	32%	7	54%
J2***	Program help against mining activity	13	68%	2	15%
J3	Reduced negative externalities (non-mining)	2	11%	0	0%
J4	Operation is more sustainable (unspecified)	5	26%	4	31%
J5	Protected and/or improved wildlife populations	3	16%	1	8%
J6	Protected and/or improved wetlands/water quality	4	21%	1	8%
J7***	Tax benefits	0	0%	7	54%
J8	Detailed management plan	8	42%	4	31%
J9	Other benefits	11	58%	4	31%
J	Total responses	52	274%	29	223%
		n = 19		n = 13	

Concerns and Willingness to Recommend the Program

The surveys concluded with three final questions. We invited landowners enrolled for more than a year to express any concerns about the program. They were asked if any restrictions had prevented them from doing something they wanted to do, and if they would encourage other farmers to join the program.

The concern mentioned most frequently was the lack of post-proclamation visits by experts, with 41 percent of farmers volunteering that view. The typical statement was that they got a few visits early on but had not seen anyone in several years. Farmers primarily were interested in getting additional input from a grazing expert to see how the grasslands were doing and what new steps could be taken. They often mentioned the potential benefit of new scientific findings, and hoped that they would be kept informed about them.

Farmers also said that having help to identify new invasive species would be useful, and that the biodiversity censuses were interesting. They wanted someone to come out and give them a sense of how they were doing, both for their own interest and to ensure that the program was considered successful. This was echoed in the relatively high level of concern about a perceived lack of annual audit activities and other kinds of help. One farmer stated “There has been no post-proclamation support since [an employee from an NGO] left. The only guys who haven’t let us down are Working for Wetlands.”

Eight landowners said that they would really appreciate more (or at least some) financial assistance, for herbicide, for wetland protection and rehabilitation, and for special projects that would benefit biodiversity. Several of them mentioned that there had been suggestions of tax benefits (primarily the rates exemption) but that they had no expectation any would ever develop.

Six landowners specifically said that they were very concerned that the program would not be successful in keeping mines away, a problem they typically discussed quite passionately. This is largely a local effect coming from two areas in Mpumalanga; as noted previously, many other landowners felt that the program had in fact been very beneficial with respect to mining activity. Even among those landowners, though, there was a concern that the risk of a mine coming into the area was always present.

Table 17: Program Concerns and Binding Restrictions, Full Sample

Code		#	%
K2	Too few visits from experts	12	41%
K3	Too few audits by agency	7	24%
K4	Too few meetings among farmers	3	10%
K5	Program won't keep the mines away	6	21%
K6	No enforcement against poaching	3	10%
K7	There is not enough financial help	8	28%
	n = 29		
K1	No restrictions affect what I want to do	26[+]	100%[+]
K8	I would encourage other farmers to join	30	94%
	n = 32		

[+] This percentage excludes six farmers who did not directly answer the question. However, none of the farmers, including those six, reported any sort of restriction on their normal or desired farming activity.

In addition to the concerns about post-proclamation support, there were a few concerns that the landowners themselves were not meeting all their obligations. PEs are run by the landowners in the program, and they are required to have an organized group of leaders who call meetings and set collaborative agendas to address the terms of the management plan. Farmers often mentioned that they don't really like meetings, and that it is hard to get them to commit to a particular time. As a result, meetings did not happen as often as they should. They felt that an NGO could do more to call such meetings, though it is clearly their own responsibility. A few farmers in areas where mining threats were the highest felt that their group was not effective.

None of the farmers surveyed indicated any negative effects on their own land use from the program. They typically said everything had been positive and that the management plan was very clear; there were no surprises about what practices were allowed. Many of them said the process of writing the plan had been very collaborative. Several farmers also noted that costs and the local environmental conditions meant that converting grasslands to field crops was not economically practical, so they couldn't really make dramatic changes to their farming practices anyway. Others mentioned that since they were in a water catchment area or other regulated area, there were already land-use restrictions on their farm before they entered the program. A sample comment is below:

> The PE hasn't stopped me from doing anything, though we do think twice before we do something. There are no negatives. Landowners who wanted to sell to miners told us it would cut our farming options- none of that has happened.

Finally, almost all farmers said that they encouraged other farmers to join, and many said that other farmers were very interested. One phrase that was used several times was that joining the program was a "no-brainer". Another farmer simply said "Every farmer should do this." Only two farmers said they did not encourage anyone. In one case, the farmer said that there weren't any farmers in his area that weren't already involved. The other landowner was disappointed in several recent events, primarily significant costs to fight an unrelated lawsuit by a neighbor that

had greatly reduced his ability to cover stewardship expenses. Even though that was unrelated to the NR status, he felt the status should have somehow been more helpful.

Table 18: Program Concerns and Binding Restrictions, Controlling for Mining Concern

		Mining Concerns		No Mining Concerns	
		#	%	#	%
K2	Too few visits from experts	9	47%	3	30%
K3	Too few audits by agency	6	32%	1	10%
K4	Too few meetings among farmers	3	16%	0	0%
K5**	Program won't keep the mines away	6	32%	0	0%
K6	No enforcement against poaching	3	16%	0	0%
K7	There is not enough financial help	7	37%	1	10%
Sum**	All concerns	34	179%	5	50%
K2,3,6,7	Agency-specific concerns	25	132%	5	50%
		n = 19		n = 10	
K1	No restrictions affect what I want to do	17^{+}	$100\%^{+}$	9^{+}	$100\%^{+}$
K8	I would encourage other farmers to join	18	95%	12	92%
		n = 19		n = 13	

Six of the farmers who joined the program to prevent mining were the only ones who raised the view that the threat of new mines was still a large problem. Despite the strong feelings shown by those individuals, 13 of the 19 other farmers who listed mining as a reason to enroll did not list mining threats as an ongoing concern (Table 18). None of the other concerns had statistically significant differences between the two groups, and the answers to binding restrictions and encouraging other farmers were virtually identical. If all the possible concerns are totaled, the number in the mining sample is significantly higher for those worried about mining; that group mentions each type of concern a higher percentage of the time than the non-mining group.

However, it appears that the difference in feelings between those groups may be only partly due to a continued threat of mining. Separating the Mpumalanga landowners shows an even greater difference in comparison to those from other provinces. These landowners were again more likely to be worried about mines, as well as more likely to say that there were too few visits by experts, too few audits by the agency, and not enough financial help. The seventeen landowners from Mpumalanga raised thirty-five individual concerns, an average of 2.06 concerns per landowner. The same ratio for the other provinces is 0.33, based on just four concerns expressed by twelve landowners.

It is quite clear that landowners in Mpumalanga have significantly more concerns about the program, in addition to the worries about ongoing mining threats. Looking at the four types of concern the agency is most likely to be able to control (expert visits, audits, law enforcement, and financial help), there is again a much higher rate of concern in the Mpumalanga sample, statistically significant at the 1% level.

Table 19: Program Concerns and Binding Restrictions, Controlling for Province

		Mpumalanga		Other Provinces	
		#	%	#	%
K2**	Too few visits from experts	10	59%	2	17%
K3***	Too few audits by agency	7	41%	0	0%
K4	Too few meetings among farmers	2	12%	1	8%
K5**	Program won't keep the mines away	6	35%	0	0%
K6	No enforcement against poaching	3	18%	0	0%
K7*	There is not enough financial help	7	41%	1	8%
Sum***	All concerns	35	206%	4	33%
K2,3,6,7***	Agency-specific concerns	27	159%	3	25%
		n = 17		n = 12	
K1	No restrictions affect what I want to do	18^{+}	$100\%^{+}$	8^{+}	$100\%^{+}$
K8	I would encourage other farmers to join	18	95%	12	92%
		n = 19		n = 13	

To be fair, farmers in the other provinces all mentioned various problems with program administration in other ways, though they did not choose to list them as significant concerns at the end of the interview. The majority of farmers mentioned that the enrollment process had taken much longer than expected, with long unexplained delays in approval by the provincial agencies. Many of them said they could never have finished the process without help from the EWT, WWF-SA, or Conservation Outcomes. If the provincial agency does not provide post-proclamation support, farmers often look to these NGOs. Unfortunately, these groups do not necessarily have the financial or staff resources needed to provide it at the desired levels.

Many farmers, from every province, had other comments suggesting that they did not expect the agency to follow through on a variety of things discussed prior to enrollment. For example, one landowner said that a neighbor of his in the buffer zone was held to a higher regulatory standard when applying for a land use change. This is a formal part of the program and should have been expected, but the landowner remarked that he had been quite surprised it had actually happened. Most of these farmers did not express these likely failures as strong concerns, simply as basic expectations. The Mpumalanga landowners were much more detailed about their concerns, and worried that it would cause problems in the future if there were no data showing that they had fulfilled their commitments.

Community Experiences

The surveys completed by the three community representatives were included in the results presented above. The two groups with Biodiversity Management Agreements are in Conservation Areas and are not subject to the same conditions, so they could not respond to

some of the questions. This section summarizes the specific experiences of all three communities.

Each of the three representatives indicated that their communities were very happy with the decision to protect the land. One community has been a PE since 2009, much longer than the duration of most of the farmers interviewed. The primary motivation was the drying-out of a wetland and the resulting loss of species, especially the Blue Crane and certain indigenous plants. Prior to enrollment, the primary land use was for small garden plots around homesteads and general grazing for horses and cattle. The management plan assisted them in developing a series of camps with a grazing rotation and a burning plan. They used a grazing expert to set appropriate stocking rates for livestock, and they say they have received a considerable amount of help from Ezemvelo KZN Wildlife, the KwaZulu-Natal agency in charge of the program. When asked about benefits from participating in the program, the representative said:

> We have seen huge benefits. Wildlife species are coming back. The grass is much better, and 30 people have jobs removing alien plants. The wetland is now full of water, after being nearly dry before we started the program. That's what we wanted to see. The projects benefit everyone in the community. It is very important to have the management plan- that is what makes it sustainable.

This community participates in learning exchanges, which are opportunities for others to come observe and ask questions about their experiences. The other two representatives came from communities who had attended such an exchange and wanted to start at a lower level of program. In both cases, the group has finished the initial five-year contract and has signed a new five-year contract. Their experiences have been very similar.

The primary motivation for these two groups was protecting the land for future generations. Stewardship activities have mainly included work to improve the grasslands and to remove invasive plants. One group had received money to fence in a portion of their land more securely in order to help keep out poachers, but did not qualify for as much stewardship help because they are not in a Protected Area. Both agreed that their grasslands had improved from what they were prior to the agreement; one representative said "Our grasslands are much, much better. We are getting recognition from others. They know our property is special, that something is happening." Neither representative reported any problems with the program. Both said that other communities who are having problems come to see them for help, and would like to join the same program.

Conclusion

It is important to remember the limitations of this project. This is not a random sample of farmers; like any survey, it is a function of who was contacted and who agreed to participate. It asks for a self-assessment of stewardship activity, but does not evaluate the level of stewardship accomplished. It does not evaluate actual changes to biodiversity since the land entered the program.

Within that context, there are several clear conclusions drawn from this research. First, the farmers who participated in the survey feel very strongly that it is beneficial, both in protecting biodiversity and in helping their operation by reducing costs, reducing risk, and/or increasing revenues. Every landowner contacted listed positive aspects from their participation. Even landowners who are extremely unhappy about a continued threat of mining pointed out positive aspects of the program, and each of them still encourages others to join the program. Providing information about these attitudes should help persuade additional farmers to protect their lands that still have high levels of biodiversity and opportunities for improvement.

Second, those who joined the program to try to prevent mines in their area were just as likely to say they were motivated by conservation values as those who did not mention mining. They also took similar stewardship actions and found similar benefits from being in the program. While there may well be sample selection issues at work here, there is no reason to assume that farmers only join to fight mining in order to protect their own livelihoods, ignoring their stewardship obligations.

Third, the concerns about the threat of mining appear to be very real in some areas, and having a Protected Environment does not appear to automatically prevent future mining nearby as currently administered, at least in some areas. Even in areas where mining is not yet a significant activity, farmers in Protected Areas continue to fight prospecting applications, often participating in expensive lawsuits. An important question arises here: if an agency can allow mining in a buffer zone, does a Protected Area truly protect local biodiversity? This is an area where additional guidance, or perhaps just meaningful enforcement of existing regulations, is critical.

Finally, while farmers from every province expressed the view that program administration was inadequate, most did so with a degree of resignation and the feeling that they would not count on any help and do the best they could. The Mpumalanga results are clearly different. Farmers in that province were much more straightforward about the lack of support and communication. This is not simply the result of continued threats of mining activity in those locations, though mining is clearly very important, but appears to represent a broader set of issues. Others have pointed out the current failure to provide the resources required for the post-proclamation support that landowners need (Pasquini et al. 2009; Selinske et al. 2015; SANBI 2017b; Wright et al. 2018); this study further confirms those findings, especially for Mpumalanga.

Attaining the national land protection goals on private lands is going to require finding a substantial number of pristine or semi-pristine properties and persuading the landowners to consider pursuing biodiversity stewardship, hopefully as a Protected Area. Clearly, landowners with a strong conservation ethic should be interested in joining the program. These results also

indicate that farmers who are primarily concerned about the sustainability of their operation should also be strongly motivated to learn more about what the program offers. Ideally, participating in the program encourages the farmers to develop a strong conservation ethic, as has been noted in some of the comments.

Financial benefits are also a motivation for farmers, and it is clear that many of them feel that they have not received the help they need to make substantial improvements that benefit biodiversity. Definitive programs for herbicide subsidies and better access to programs like Working for Water and Working for Wetlands would be very useful to farmers. More help accessing mitigation and offset funds would be welcome. Benefits such as these would help improve biodiversity while simultaneously reducing costs for whatever portion of that work farmers would do anyway. Landowners are expected to keep their commitment to biodiversity stewardship; it is not unreasonable to hold government agencies to the same standard, and to give them the resources necessary to meet it.

Bibliography

Barendse, Jaco, Dirk Roux, Bianca Currie, Natasha Wilson, and Christo Fabricius. 2016. "A Broader View of Stewardship to Achieve Conservation and Sustainability Goals in South Africa." *South African Journal of Science* 112 (5/6): 1-15.

Boon, Tove, Stine Broch, and Henrik Meilby. 2010. "How financial compensation changes forest owners' willingness to set aside productive forest areas for nature conservation in Denmark." *Scandinavian Journal of Forest Research* 25: 564-573.

Carruthers, Jane. 2008. "Wilding the farm or farming the wild? The evolution of scientific game ranching in South Africa from the 1960s to the present." *Transactions of the Royal Society of South Africa*, 63(2): 160-181.

Clements, Hayley and Graeme Cumming. 2017. "Traps and transformations influencing the financial viability of tourism on private-land conservation areas." *Conservation Biology* 32(2): 424-436.

Clements, Hayley, Graham Kerley, Graeme Cumming, Alta De Vos, and Carly Cook. 2019. "Privately protected areas provide key opportunities for the regional persistence of large- and medium-sized mammals." *Journal of Applied Ecology* 56: 537-546.

Cousins, Jenny, Jon Sadler, and James Evans. 2008. "Exploring the Role of Private Wildlife Ranching as a Conservation Tool in South Africa: Stakeholder Perspectives." *Ecology and Society* 13(2): 43.

de Snoo, Geert, Irina Herzon, Henk Staats, Rob Burton, Stefan Schindler, Jerry van Dijk, Anne Marike Lokhorst, James Bullock, Matt Lobley, Thomas Wrbka, Gerald Schwarz, and C.J.M. Musters. 2013. "Toward effective nature conservation on farmland: making farmers matter." *Conservation Letters* 6 (2013): 66-72.

De Vos, Alta, Hayley Clements, Duan Biggs, and Graeme Cumming. 2019. "The dynamics of proclaimed privately protected areas in South Africa over 83 years". *Conservation Letters* 2019:e12644. https://doi.org/10.1111/conl.12644.

Department of Environment, Forestry and Fisheries, Republic of South Africa. 2020. "Protected Areas Register". https://egis.environment.gov.za/protected_areas_register. Last accessed March 19, 2020.

Department of Environmental Affairs, Republic of South Africa. 2016. *National Protected Areas Expansion Strategy for South Africa 2016.*

Fairfax, Sally, Lauren Gwin, Mary Ann King, Leigh Raymond, and Laura Watt. 2005. *Buying Nature: The limits of Land Acquisition as a Conservation Strategy, 1780-2004*. MIT Press: Cambridge, MA.

Fischer, Joern, Tibor Hartel, and Tobias Kuemmerle. 2012. "Conservation policy in traditional farming landscapes." *Conservation Letters* 5: 167-175.

Gallo, John, Lorena Pasquini, Belinda Reyers, and Richard Cowling. 2009. "The role of private conservation areas in biodiversity representation and target achievement within the Little Karoo region, South Africa." *Biological Conservation* 142: 446-454.

Gibbons, James, Emily Nicholson, E Milner-Gulland, and Julia Jones. 2011. "Should payments for biodiversity conservation be based on action or results?" *Journal of Applied Ecology* 48: 1218-1226.

Gloss, Lance, Emily Myron, Heena Ahmed, and Laura Johnson. 2019. *International Outlook for Privately Protected Areas: Summary Report*. International Land Conservation Network (a project of the Lincoln Institute of Land Policy) – United Nations Development Programme.

Hardy, Mathew, James Fitzsimons, Sarah Bekessy, and Ascelin Gordon. 2017. "Exploring the Permanence of Conservation Covenants." *Conservation Letters* March 2017, 10(2): 221-230.

Horton, Katherine, Heather Knight, Kathleen Calvin, Joshua Goldstein, and Jennifer Herrington. 2017. "An evaluation of landowners' conservation easements on their livelihoods and well-being." *Biological Conservation* 209: 62-67.

Kabii, Thomas and Pierre Horwitz. 2006. "A review of landholder motivations and determinants for participation in conservation covenanting programmes." *Environmental Conservation*, 33(1): 11-20.

Lapeyre, Renaud and Yann Laurans. 2016. "Innovating for Biodiversity Conservation in African Protected Areas: Funding and Incentives". https://www.diplomatie.gouv.fr/IMG/pdf/study-innovative-instruments-african-pas_iddri_iucn_maedi-full_cle0eb6f9.pdf

Lindsey, P. A., S.S. Romanach, and H.T. Davies-Mostert . 2009. "The importance of conservancies for enhancing the value of game ranch land for large mammal conservation in southern Africa." *Journal of Zoology* 277: 99-105.

Lute, Michelle, Caitlyn Gillespie, Dustin Martin, and Joseph Fontaine. 2018. "Landowner and Practitioner Perspectives on Private Land Conservation Programs". *Society & Natural Resources* 31(2): 218-231.

Moon, Katie and Cocklin, Chris. 2011. "A Landholder-Based Approach to the Design of Private-Land Conservation Programs". *Conservation Biology* 25 (3): 493-503.

Pasquini, Lorena, Richard Cowling , Chasca Twyman, and John Wainwright. 2009. "Devising Appropriate Policies and Instruments in Support of Private Conservation Areas: Lessons Learned from the Klein Karoo, South Africa." *Conservation Biology* 24(2): 470-478.

Republic of South Africa. 2004. *Government Gazette*. Vol. 467, May 2004, No. 26357.

Selinske, Matthew, Benjamin Cooke, Nooshin Torabi, Matthew Hardy, Andrew Knight, and Sarah Bekessy. 2017. "Locating financial incentives among diverse motivations for long-term private land conservation." *Ecology and Society* 22(2): 7.

Selinske, Matthew, Jan Coetzee, Kerry Purell, and Andrew Knight. 2015. "Understanding the Motivations, Satisfaction, and Retention of Landowners in Private Land Conservation Programs." *Conservation Letters* 8(4): 282-289.

South African National Biodiversity Institute (SANBI). 2019(a). *National Biodiversity Assessment 2018: The status of South Africa's ecosystems and biodiversity*. *Synthesis Report.*

———. 2019(b). *National Biodiversity Assessment 2018 Technical Report Volume 1: Terrestrial Realm.*

———. 2018. *Biodiversity Stewardship Guideline*. A guideline produced for the Department of Environmental Forestry and Fisheries. Developed by Wilson, N., Kershaw, P., Marnewick, D., and Purnell, A.

———. 2017(a). *The business case for biodiversity stewardship.* A report produced for the Department of Environmental Affairs. biodiversityadvisor.sanbi.org. http://biodiversityadvisor.sanbi.org/wp-content/uploads/2017/07/Biodiversity-Stewardship-Business-Case-Factsheet.pdf

———. 2017(b). *Biodiversity Advisor: Tax Incentives*. http://biodiversityadvisor.sanbi.org/industry-and-conservation/biodiversity-stewardship/tax-incentives/.

Stevens, Candice. 2019. *International Outlook for Privately Protected Areas: South Africa Country Profile*. International Land Conservation Network (a project of the Lincoln Institute of Land Policy) – United Nations Development Programme.

———. N.d.-a. *Biodiversity Tax Incentives Section 37D Fact Sheet One: Fiscal Benefits Project.* http://biodiversityadvisor.sanbi.org/wp-content/uploads/2017/05/Section-37D-Info-Sheet-Fiscal-Benefits-Project.pdf

———. N.d.-b. *Biodiversity Tax Incentives Section 37C Fact Sheet Two: Fiscal Benefits Project*. http://biodiversityadvisor.sanbi.org/wp-content/uploads/2017/05/Section-37C-Info-Sheet-Fiscal-Benefits-Project.pdf

Stroman, Donna, and Urs Kreuter. 2015. "Factors Influencing Land Management Practices on Conservation Easement Protected Landscapes." *Society & Natural Resources*, 28:8, 891-907.

Sundberg, Jeffrey. 2014. "Preferential Assessment for Open Space." *Public Finance and Management* 14(2): 165-193.

Sundberg, Jeffrey and Chao Yang. 2012. “Do Additional Conservation Easement Credits Create Additional Value?” State Tax Notes 66 (9):723-742.

Taylor, William, P.A. Lindsey, and Harriet Davies-Mostert. 2016. *An Assessment of the Economic, Social and Conservation Value of the Wildlife Ranching Industry and its Potential to Support the Green Economy in South Africa.*

Wright, Dale, Candice Stevens, Daniel Marnewick, and Garth Mortimer. 2018. “Privately Protected Areas and Biodiversity Stewardship in South Africa: Challenges and Opportunities for Implementation Agencies.” *Parks* 24(2): 45-62.

Appendix: Sample Comments from Interviews

Sample Comments about Landowner Motivations[21]

It will give official status to owners against outsiders- poachers and especially miners. I want to prevent the destruction of wildlife and even entire ecosystems. This is a unique area for biodiversity, with lots of species and clean water. It's a no-brainer to protect biodiversity. We need to work with nature, farm with instead of against nature.

It makes me feel good to preserve wildlife, especially threatened species. No real economic value, but more sustainable, especially if it helps create some tourism. It's good to protect the entire environment, not just one or two species.

I was first exposed to the idea through [a local planning] process. Nature Reserve status resonated with what I felt. You can't just tread water as a conservancy. You have to make a step up, plant your flag. This is an opportunity to actually do something. We are running low on the basic systems our grandfathers could have told us about. Things are changing. Farmers are becoming conservationists…The nature in the veldt is mostly gone- we've done something to sterilize it. We need to get it back. In the end, it's in everyone's benefit. We need to fix our systems. Why did I do this? Because this was something I can do. Sometimes you just have to decide to make a statement.

Our Inkosi [chief] was concerned about the wetland species, especially the loss of species like Blue Cranes and indigenous plants. He wanted conservation for future generations [community representative].

My motivations were first, to protect my property rights from expropriation, and second, to get the benefit of the scientists and experts.

I want to protect it from "the takers". Politicians. I also want to protect it for (and perhaps from) my grandchildren. I am passionate about the environment. One of my key life goals is to give back to the environment in a big way [resort venue owner].

We are commercial farmers, but at heart we are conservationists. We are the custodians. We need to hand it to the next generation in the current condition, if not better. So beautiful, extremely biodiverse, special, and unique- why would you not want to protect it? The whole family agreed. It's a no-brainer.

The big concern was coal mining. Our biodiversity and the condition of the veldt is pristine, we wanted to conserve it. This area is a big water engine that feeds the Pongola, Vaal, Assegai, and Tugela rivers. The most important goal of a Protected Environment should be to protect biodiversity.

[21] All quotes are from individual landowners who primarily raise cattle on the protected land, unless otherwise noted.

The big thing here is the threat of coal mining, along with water security. Preventing coal mining adds value to the farm title.

We wanted to improve conservation and local tourism. Conservation is the farmer's way…to a point. Overgrazing and land exhaustion were problems.

The goal was conservation, especially keeping the mines out and keeping the water clean. It's still working, but we don't know for how long.

We need to conserve what we have, for our children. There is a variety of ecosystems here but nature reserves alone can't save enough. There is lots of population pressure. We need to stop mining, or at least make it happen responsibly by protecting our soil and water.

The 6th generation of this family is here now; I want to keep the farm in the same state for the future. A big need for them is clean water.

We did it because we could do something for the environment. Protecting cranes, oribi, wildlife generally. Our piece really should be part of that [adjoining public] reserve. I am securing it for the future, the next owners.

I love nature and have done a lot to fight alien plants. This program was a no-brainer for me. I farm cattle with grass- the condition of the veldt is the key priority. The area has wild wildebeest, blesbok, and other species. There has been too much neglect in these areas.

We wanted to prevent mining. There are cranes here. What's the point of conserving your farm if there's a mine right next door? Moneywise it has no impact on us but we want our children to be able to farm here like it is. We want to keep the birds here. You've got to farm in a good way, as our grandfather did. The more you put in, the more you get out in the future. We want to live next to nature, not just take.

The reason is to stop mining. Mining won't really affect my operation, but it will destroy the wetland and the birds, wreck roads, crush tourism.

We are concerned about sustainability and mining damage. Mining is bad for the sustainability of nature and for farming. The springs go bad when mining comes in.

I didn't want to ruin the environment through mining. I used to do mining so I know a lot about it. We need to protect the water. You can remediate the land, but you can't rehabilitate the water.

We wanted to conserve the land for future generations [community representative].

Sample Comments about Stewardship: Agricultural Practices

We changed our grazing habits by reducing the load on the land, per the management plan. The conservation stuff really helped.

There are grazing and burning plans in place. Based on some workshops we have completely changed burning practices that were in place for hundreds of years to new timing that helps the native grasses. It was very good to have spent time in those classes.

Lots of farmers have embraced the management plan. Nothing done has affected farming activities negatively. We cut the blue gum, which we would have done anyway. I've had to stop jackal poisoning, but I didn't do it much anyway.

The grazing, burning, stocking requirements are similar to current use. We have done some alien work and follow-up; starting another round this season. Since starting the process, we are much more aware of the invasives and are being much more aggressive all over the farm, not just in the Nature Reserve area. We also changed the burn management to adapt to Wattled Crane breeding schedules within our burn season.

Courses were offered on grazing, burn management, but every farm is different. The advice runs against the grain. I've taken out fences, do a 3-4 year burning rotation. It depends. Now I burn as needed based on my assessment. The courses inform, you adjust to local conditions and year differences.

The management plan helps us understand basic invasive plants- bramble, wattle. The veldt and biodiversity assessments were very helpful.

Spraying for "bankrupt bush" is going great. I have 500 hectares; originally I had two camps, now I have six camps. I'm using much more high-production grazing. This is based on science and practice.

We are removing aliens, now have a formal grazing plan with more camps. The cows are not just roaming. The camps are numbered, and we have a burning plan. We have also restricted everyone to one road instead of just driving anywhere [community representative].

The management plan basically covers current practices. We are currently removing invasives anyway, though the plan includes two plants I hadn't heard of yet. Neighbors are not likely to need to change their practices from the current ones.

We use new burning regimes and better grazing plans like bulk grazing with heavy rest. Very active management of some areas that needed rehabilitation, and better game management [resort venue owner].

The old farmers have already been doing what the grassland specialist says to do. The new farmers have made lots of mistakes. The management plan is similar to our current practices, but will help with the wattle and the wetlands. We are only two years in.

We are removing invasives- we were already doing it. We had good grazing and burning practices standing, just doing the same things we've already done, but we have made small changes to protect the wetlands from fire.

We are always concerned about nature. We are going to no-till, using cover crops. We had started before the plan and now the percentage is rising to close to 100 percent. We have better pasture management through more stock use, less burning. We work hard on invasives- wattle, scotch thistle, wild tomato, bankrupt bush. We have better methods using the management plan.

We have gone to some wildlife-friendly fencing. We also started removing invasives after the management plan- wattle, blue gum, wild tomatoes. We have always looked after our grazing. Once this became a PE we started doing no-till farming.

There's a grazing plan, with inspections every couple of years. It's improved. Keep invasives (wattle, lantana) away. There was a lot- we've almost gotten it done. Burning plans have changed.

We are using cattle as a management tool, at recommended stocking rates which are less than commercial rates, which I previously used. We have a more formalized burning program with rest plans. That has been useful. I am moving to high-intensity grazing. Everything gets a fair rest. I am managing invasives—postweed, bramble. The management plan added postweed.

The management plan is very new, just going. So far we have worked on wattle encroachment into the indigenous forest, that's our biggest, most pressing issue. We have two people doing that on a permanent basis, at our cost. There have been slight modifications to our grazing and burning practices, based on new science.

The positive thing is that it made you think twice about what you do. You realize that orchids and frogs are important.

Sample Comments about Stewardship: External Assistance

No tax incentives were offered or wanted. A little money for fencing was nice but we need to make it on our own. EWT help with paperwork and fighting fracking is important.

We don't expect any money from the government. EWT help developing the management plan was very helpful, as is the help fighting mining. The Dept. of Agriculture is providing our herbicide. BirdLife helped fund the new bird hide that we put in. A big gain has been the use of rehab mitigation money for mining damage done elsewhere to fund projects here. Perhaps there could be some guide training?

One NGO came up with money to remove wattle on farms. It employed local people, too. Birdlife South Africa also trained local people as bird guides.

WWF gave us dogs to protect our sheep; this reduced the use of poison and the need for shooting [jackals]. Unfortunately, the dogs created a conflict with a neighbor and we eventually had to get rid of them. They worked great, though.

We had a legal wrangle with a neighbor who kept driving his cattle through the farm. Cobus [EWT employee] suggested Nature Reserve status to strengthen the property protections. We've had great support from them. We wanted help to get herbicides to clear the wattle. Cobus knows the law and knows nature; he was very helpful.

Working for Wetlands put some walls in to stop erosion and they did do a nice job, I must say.

Working for Water came in and removed wattles, gave us herbicide. It was successful, but it's an ongoing story. When guys don't have money to buy herbicide, they come back fast.

Working for Water started a big project; we wanted them to give us the chemicals and we'd use our own people. They don't do a good job. We did it and it worked beautifully. Then they cut us off. We carry on.

We have a very good relationship with KZN Wildlife; they have assisted with a lot of things [community representative].

The commitment level of the people I work with from Conservation Outcomes has been great, they are wonderful

Sample Comments about Program Benefits

Conservation has saved my operation. I will never have to buy a tractor again. I use no silage, no fodder, just veldt now. I have the same number of cattle, but no more need for additional feeding.

[Does the Nature Reserve help the guesthouse business?] Absolutely. It's a bargain for us. We take guests on hikes up there. Its use as a nature reserve is valuable to the lodge. We need to get rid of more invasives, fix some gullies. Our guests really enjoy that particular farm. Some guests come specifically to clear invasives for fun [guesthouse owner].

Sheep farmers now need to meet Responsible Wool Standards if they want to export to the EU. That requires good husbandry, socioeconomic responsibility, and environmental responsibility. The Protected Environment plan had already developed the last two, so I got two birds with one stone. Last year I got a premium of 13 rand per kilo for wool by being in the program.

A crane-friendly crop program, using softer chemicals, might be attractive to customers. It is likely to help with any future certifications.

The Protected Area is preserving the area for cranes, and we have the Crane Festival. There's been a very positive reaction from farmers to make a good change; people are starting to look differently at things. It isn't helping their job, but it's helping conservation.

The PE lets you protect what you have; that safety gives you the incentive to improve it. Longevity creates an incentive. It helps us with mining, but one got in here anyway. Without the PE it would be much worse. Mining has wrecked more farms here than land claims.

This was actually value-adding. Some of the springs are preserved, because of Working for Wetlands. This stopped our cattle from getting bogged down.

This is a really great program for weekend farmers; they need to learn the best way to do appropriate farming. The PE can really help- it's had a strong effect there. The management plan and grassland studies are very helpful. Most weekend farmers are looking for guys to teach them. No firebreaks, no knowledge- they overgraze, then their stock comes on our farm. Bad farmers can be worse than coal mines. They need education on how to farm with conservation.

Our yields have gone up from the methods in the management plan. The PE had a good effect on a location study for a cell phone tower; the location protects cranes.

It's wonderful. Very good. You don't see the results today, but we must do it. There's no argument about that. No mining here yet. Being a PE has definitely helped. There was one protest march in the local community by people who wanted coal jobs, but now they realize that tourism makes more and better jobs. My daughter does bird tours to some farms. She's helped one guy become a bird guide. All post-proclamation. This is good for bird conservation.

Enrollment hasn't made farming more profitable, but sustainable practices are becoming more common now.

Our grasslands are much, much better. We are getting recognition from others; they know our property is special, that something is happening [community representative].

There have been some changes to burning plans for some guys. The grass specialist was here a couple times and the veldt just got better and better. The grazing and burning regimes are definitely better. We've seen a huge increase in breeding pairs of cranes, from 15 to 50. At least 3 or 4 areas now have breeding cranes that didn't have cranes before. Leopards, caracals, bushbuck are all increasing a lot. We've had pleasant surprises of biodiversity going up. Our wildlife has increased substantially. Raptors are

here in crazy numbers, kinds we never saw before. Bird populations in general are way up. Guys are noticing things and appreciate them now. Poisons are all out the door.

No mining! The grazing is better. There hasn't been an inspection in three years, but it is much better. So happy the mines are still out. We couldn't do it without the PE, we haven't got the expertise. Lots of other areas now want to do the same.

Definitely improvements in the wildlife- oribi, duiker, etc. Taking out the wattle really helped the water flow.

We have seen huge benefits. Wildlife species are coming back. The grass is much better, and 30 people have jobs removing alien plants. The wetland is now full of water, after being nearly dry before we started the program. That's what we wanted to see. Projects benefit everyone in the community. It is very important to have the management plan- that is what makes it sustainable [community representative].

There has been an influx of mines, with no rehabilitation; these seem to be owned by ministers. They create lots of problems. The Protected Environment is a good way to fight mines, it has been very successful.

It does give us something to use against miners. We have kept out some mines. I like that. If you mine here, you can't make much money, if you make any, so there won't be anything for remediation. The PE has made people more aware.

The management plan is incredibly comprehensive. We are seeing improvements in the quality of grasslands, lots of rehabilitation of areas, better game management. The fiscal benefit wasn't the driver, but it helps because this place is expensive. We can now deduct management expenses as well as the fiscal benefit itself [resort venue owner].

Grassland is definitely doing better. We are getting the fiscal benefit. I honestly believe that the herd of cattle has had an ever-increasing re-conception rate. That's the true test. I would like to get a premium for grass-fed beef, but there's not a sophisticated enough market for that, at least not yet. I would also like to pursue carbon credits, maybe some offsets.

Our firebreak has prevented fires, so the primary forest is improving and expanding. The grass is doing very well, but still needs to be improved.

This is a great program for farmers. The expert scientific help you get from the comprehensive, thorough management plan would be incredibly expensive to do on your own. The grazing management and burning regimes have improved drastically based on what we've learned from that. It's the right thing to do. I intend to triple my herd on the same ground through better management.

Sample Comments about Program Concerns

Our five-year management plan is coming to an end. We need feedback on our progress and help developing the next plan. We need to be able to show what we've done to meet our requirements so we can renew.

There should be a bit more cooperation between owners and KZN Wildlife to help with new uses of the farm- game, etc. We need advice, regular contact, mentoring.

Brian [a provincial employee] is no longer here, so there is not a lot of structure. The water guys [Working for Water] are helping in one area. There is not nearly enough post-proclamation support.

I would like annual visits from ecologists and grazing specialists. You can't see changes on your own place, so an annual visit from an outsider gives you new eyes to discover birds, get a census, etc. It's good to have a dialogue with someone.

We're all getting comfortable, once things got going. We probably could get some more status checks. A grassland specialist does come through annually to check. Maybe we are too comfortable- check on us.

My honest opinion is that it's fallen flat completely. We've had one or two meetings where people talked and no one did anything.

We hoped for a complete stop to mining applications. The new government administration doesn't care- there is no consistency between how the two agencies act. There is mining right now in the buffer zone. Glencore [a large mining company] might help us fight it because they are mitigating right next to a new potential mine site. We are managing a mine application in our area. They have too much money and they have minister ownership- we hope to get a remediation fund from them before work starts. The two agencies are not working collaboratively as we hoped. There are no other issues.

How is the PE going to stop the mines? Too many applications. Too many top-level people involved trying to get new mines in. Blasting is chasing the birds away. There's no road maintenance from coal companies unless their trucks get stuck. The last management meeting was worthless; we're fighting a losing battle. An old sand and rock mine gradually became a coal mine; made it easier to accept the mine. Money talks. Nothing happens to guys who do stuff illegally. None of the court cases happen; there are no criminal findings.

[An NGO employee] was great, helped with annual audits, but she just left. Not sure what to expect now. No post-proclamation support since she left. The only guys who haven't let us down are Working for Wetlands.

The incentives should be better. Working for Water should still be helping us. Policing the PE (poachers and farmers alike) is critical. Don't give me a tax incentive- help me

take actions. Pay for things that will help wildlife. Give me discounts for fencing, labor subsidies, protective clothing for herbicide. Give us Working for Water and Working for Wetlands.

Sample Comments about Restrictions on Farming Practices

Nothing done has affected farming activities negatively. We cut the blue gum, which we would have done anyway. I've had to stop jackal poisoning, but I didn't do it much anyway. For me, it's been entirely positive.

The PE hasn't stopped me from doing anything, though we do think twice before we do something. There are no negatives. Landowners who wanted to sell to miners told us it would cut our farming options- none of that has happened.

I have not been kept from doing anything I would do. I had a neighbor who didn't want to join because he needed new fields. He did join, he worked with them, and he's satisfied.

I've had no negative consequences whatsoever.

There hasn't been anything that is negative [community representative].

No, nothing. We have always wanted to protect the farm, so this hasn't hurt us at all. We care about wildlife.

There are no problems, it's not stopping anything we would have done. We wanted to protect the area, so the management agreement reflects that.

There is no problem with the management plan. Some guys don't want to be in PE because they think they will be told how to farm, or not allowed to plow new fields. They aren't told how to farm, and even outside the PE they need permission to plow.

Sample Comments about Willingness to Recommend the Program

Sure. People ask how they can join. There needs to be more government action.

I would definitely encourage people. I have not one day of regret. I'm a farmer, not a speculator.

My feeling is let's get our Nature Reserve in order and offer opportunities for people to learn about nature with eco-parties and so on. I want to encourage them to preserve what they have on their own farms. Get it right, spread the news.

Most farmers want to participate. We have to keep our environment safe. There are over 40 farmers in this group.

Very happy to recommend to other farmers. So far 15 out of 75 are in the group.

I would encourage anyone to join. The export market increasingly demands this kind of responsibility, so provide it! It all fits together.

Those that have problems are coming to see us for help. They wish they could be part of this program [community representative].

For sure. I've been trying. Everyone has to fight bankrupt bush in order to win. Applying business practices to farming works. My neighbors have an environmental interest, but are not scientific. They need to see something.

Definitely. For the future you must do it. Your kids will never have anything otherwise. To be honest, everybody wants to join because of mining. It would destroy farming.

I always encourage people to join. You must preserve water; the desert is coming.

Happy to encourage it. New PEs are starting near us. Most who don't want to be in don't know the ins and outs. They aren't told and they don't want to be told. They worry about the negatives but don't see the positives.

Yes, I've tried to encourage my neighbor to do this. We would create a nature corridor of our own, collectively we would have a bit more clout.

Some neighbors have come to ask if they can join our program. I'm very enthusiastic.

Yes. Numerous Learning Exchanges are coming to us to learn, and asking questions [community representative].

Every farmer should do this.