

Sibanye-Stillwater's biodiversity footprint for its direct operations

Pilot assessment as per the Biological Diversity protocol

Group-level consolidated report

May 13th, 2022



1. Highlights

- Sibanye-Stillwater undertook an initial biodiversity footprint assessment aligned with the Biological Diversity Protocol (BD Protocol)¹ in 2021. The aim was to complete a desktop assessment with the existing information as well as identifying the gaps that need to be addressed going forward. Sibanye-Stillwater is committed to a process of continual improvement and annual updates, until post-mine closure or until a mine has been sold.
- This assessment included the direct biodiversity impacts of Sibanye-Stillwater for its direct operations:
 - South African (SA) operations: Beatrix, Blue Ridge, Burnstone, Driefontein, Ezulwini, Kloof, Kroondal, Marikana (incl. ex Aquarius), Rand Uranium and Rustenburg Platinum Mines (RPM);
 - United States of America (USA) operations: East Boulder Mine (EBM) and Stillwater Mine (SWM).
- As per the BD Protocol, business impacts on biodiversity includes impacts on ecosystems and material species. While this report² compiles the net ecosystem impacts of both SA and USA operations, it does not yet cover impacts on material species for SA operations. Due to the lack of appropriate data for these sites, impacts on material species will be evaluated at a later stage, considering the complex nature of these assessments an integrated plan will be developed to find feasible measurement methods in future.
- Sibanye-Stillwater's ecosystem asset register or inventory holds 38 ecosystem types, 24 for SA operations and 13 for USA operations.
- Overall, the Total Biodiversity Footprint of Sibanye-Stillwater was 49 897,41 Ha at date of acquisition of various assets, with around 86% of Negative Biodiversity Footprint (42 998,47 Ha eq.) and 14% of Positive Biodiversity Footprint (6 745,78 Ha eq.). At the time

¹ URL: <https://www.nbbnbdp.org/bd-protocol.html>

² Preferred citation: Houdet, J., Teren, G., 2022. Sibanye-Stillwater's consolidated biodiversity footprint. Pilot assessment as per the Biological Diversity Protocol – Group level consolidated report. National Biodiversity & Business Network – Endangered Wildlife Trust / Sibanye-Stillwater.

of assessment (current state in 2020 / 2021), the Total Biodiversity Footprint increased to 49 912,01 Ha, with around 87% of Negative Biodiversity Footprint (43 489,32 Ha eq.) and 13% of Positive Biodiversity Footprint (6 422,68 Ha eq.).

- For SA operations, the Total Biodiversity Footprint of Sibanye-Stillwater was 48 184,66 Ha at date of acquisition of various assets, with around 89% of Negative Biodiversity Footprint (42 998,47 Ha eq.) and 11% of Positive Biodiversity Footprint (5 186,19 Ha eq.). At the time of assessment (current state in 2021), the Total Biodiversity Footprint increased to 48 199,27 Ha, with around 89% of Negative Biodiversity Footprint (43 012,26 Ha eq.) and 11% of Positive Biodiversity Footprint (5 187,01 Ha eq.).
- For USA operations, the Total Biodiversity Footprint of Sibanye-Stillwater was 1 712,75 Ha at various baseline dates, with around 9% of Negative Biodiversity Footprint (153,17 Ha eq.) and 91% of Positive Biodiversity Footprint (1 559,58 Ha eq.). At the time of assessment (current state in 2021), while the Total Biodiversity Footprint did not change (1 712,75 Ha), the Negative Biodiversity Footprint increased to 28% (477,07 Ha eq.) and the Positive Biodiversity Footprint decreased to 72% (1 235,68 Ha eq.).
- Recommendations are organised around three main topics: completing and improving the biodiversity asset register, disclosure requirements and opportunities and target setting.

Contents

1. Highlights	2
2. Key terms	5
3. Introduction and aims	6
4. Methodology	7
4.1 Setting organisational and value chain boundaries	7
4.2 Biodiversity impact inventory development	8
4.2.1 Ecosystem impact inventory	10
4.2.2 Species impact inventory	11
4.3 Accounting for net biodiversity impacts	12
4.4 Net impact modelling as per relevant scenarios informed by Sibanye-Stillwater's biodiversity policy and development plans	14
5. Results: The Biodiversity Footprint of Sibanye-Stillwater	15
5.1 Consolidated Biodiversity Footprint	15
5.2 Biodiversity Footprint broken down per operation	16
5.3 Biodiversity Footprint broken down per ecosystem	25
6. Discussions and recommendations going forward	33
6.1 Completing and improving the biodiversity asset register	33
6.2 Disclosure requirements and opportunities	34
6.3 Target setting	36
7. Contact Details:	37
Annexes	38

2. Key terms

Direct operations: all operations (i.e. assets) that an organisation owns and / or has control over.

Biodiversity (Biological Diversity): the international Convention on Biological Diversity (CBD 1992) defines “biodiversity” as the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems, and the ecological complexes of which they are part. This includes diversity within species (genetic diversity), between species, and of ecosystems. Biodiversity is a critical component of natural capital.

Biodiversity impact (or impact on biodiversity): The negative and / or positive effect of a business activity on the state of biodiversity (e.g. change in the extent and condition / integrity of ecosystems).

Mitigation hierarchy: the hierarchy refers to the sequence of actions taken to (a) anticipate and avoid impacts on biodiversity; (b) minimise or reduce impacts where avoidance is not possible; (c) rehabilitate or restore when impacts have occurred; and (d) compensate or offset significant residual impacts. This concept is widely used throughout the world and is often embedded into national legislation as regards to environmental permitting.

Biological Diversity Protocol (BD Protocol): The BD Protocol is the first standardised accounting framework that enables any organisation to identify, measure, record, compile and disclosure its biodiversity impacts. The BD Protocol focuses on impacts on ecosystems and material species. Genetic diversity is excluded at this stage.

Biodiversity Footprint (BF): a Biodiversity Footprint is the sum of positive and negative impacts of an organisation over a given organisational and value chain boundary. The BD Protocol specifies that the Total Biodiversity Footprint (TBF) is made of a Positive Biodiversity Footprint (PBF) and a Negative Biodiversity Footprint (NBF). For impacts on ecosystem, this sum equals the surface areas of ecosystems within the BF assessment boundary.

Positive Biodiversity Footprint (PBF): Sum of surface areas of ecosystems adjusted for condition / integrity with the BF assessment boundary.

Negative Biodiversity Footprint: difference or gap between the reference or pristine state of all surface area (TBF) and the Positive Biodiversity Footprint (surface areas adjusted for condition).

Material species: The taxa (species and sub-species) that are important to internal and/or external stakeholders (e.g. regulators, lenders, NGOs, local communities) or play a critical role in the ecosystem.

Hectare equivalents (Ha eq.): Hectare equivalents is a metric of ecosystem state, which is expressed as the extent (surface area) adjusted for integrity, condition or health.

3. Introduction and aims

Sibanye-Stillwater undertook an initial biodiversity footprint assessment aligned with the Biological Diversity Protocol (BD Protocol)³ in 2021. The aim was to complete a desktop assessment with the existing information, including identifying the gaps that need to be addressed going forward. Sibanye-Stillwater is committed to a process of continual improvement and annual updates, until post mine closure or until a mine has been sold.

The BD Protocol aims to enable any organisation, from any sector, to identify, measure, account for and consolidate its impacts on biodiversity for various business applications, from site management and internal reporting to external mandatory and/or voluntary disclosures. For instance, it can be instrumental to companies working on voluntary, biodiversity commitments or targets for the post-2020 Global Biodiversity Framework of the Convention on Biological Diversity (CBD), and to contribute to the Sustainable Development Goals No. 15 in terms of Life on Land.

This assessment included the direct biodiversity impacts of Sibanye-Stillwater for its direct operations. The intended goals were two-fold:

- Produce the Biodiversity Footprints (Total, Negative and Positive) of the Sibanye-Stillwater group, organising data per operation as well as per ecosystem asset category,
- Identify any data gap for the development of comprehensive, science-based net biodiversity impact accounts,
- Provide guidance on improvements going forward.

³ URL: <https://www.nbbnbdp.org/bd-protocol.html>

4. Methodology

As per the BD Protocol, assessing the biodiversity footprint of an organisation involves following the below steps:

- **Biodiversity impact inventory development:**
 - Setting organisational boundaries,
 - Setting value chain boundaries,
 - Identifying the components of the biodiversity impact inventory,
 - Assessing materiality of taxa for inclusion in the biodiversity impact inventory,
 - Choosing appropriate methods for measuring impacts on ecosystems and taxa,
 - Compiling biodiversity impact accounts.
- **Accounting for net impacts as per the Biodiversity Accounting Framework:**
 - Accounting for baseline impacts,
 - Accounting for gains and losses,
 - Compiling the Statements of Biodiversity Position and Performance.
- **Net impact modelling as per relevant scenarios informed by Sibanye-Stillwater's biodiversity policy and development plans.**

4.1 Setting organisational and value chain boundaries

When defining the organisational boundary of a biodiversity impact inventory, two approaches are available as per the BD Protocol: the equity share and control approaches. For companies with joint entities, the organisational boundary and the resulting biodiversity impact inventory may differ depending on the approach used. In both wholly owned and joint entities, the choice of approach may change how biodiversity impacts are categorised when value chain boundaries are set.

Sibanye-Stillwater elected to focus on the direct impacts⁴ of the direct operations⁵ it has control over. Sibanye-Stillwater's biodiversity footprint assessment covers:

- South African (SA) operations: Beatrix, Blueridge, Burnstone, Driefontein, Ezulwini, Kloof, Kroondal, Marikana, Rand Uranium and Rand Platinum Mines (RPM);
- United States of America (USA) operations: East Boulder Mine (EBM) and Stillwater Mine (SWM).

The Columbus Metallurgical Complex (CMC) and Precious Metal Refinery (PMR) in Brakpan were not included in the consolidated assessment. These facilities have the potential to remain in place into perpetuity, so that the mitigation hierarchy cannot be implemented in full at this time (i.e. restoration cannot occur without closure). While biodiversity footprint assessments are still envisioned, an alternative strategy and commitment in terms of no net loss and net gain still needs to be developed.

4.2 Biodiversity impact inventory development

As per the BD Protocol, compiling the biodiversity impact inventory of Sibanye-Stillwater involves identifying and recording the biodiversity components, or features, which are impacted by Sibanye-Stillwater's activities at the site. The BD Protocol recognizes two main types of biodiversity impact accounts:

- Those that record impacts on ecosystems, and
- Those that record impacts on taxa (species and sub-species).

⁴ As per the BD Protocol "For biodiversity impact accounting and reporting within the context of the BD Protocol, direct impacts constitute changes in the state of biodiversity which are caused directly by your business activities. In other words, direct impacts involve business impact drivers which can be traced to specific, verifiable biodiversity features, that is direct causal link between your company's actions (e.g. land clearing or ecosystem restoration measures) and a change in the state of ecosystems or taxa (e.g. decrease/increase in ecosystem condition, habitat loss/gain for several species). These impacts may be temporary (short-term or long-term), recurrent (e.g. seasonal, every time a specific activity is undertaken) or permanent impacts (e.g. built-up properties, such as office buildings or parking areas). For instance, the direct land footprint of your business operations leads to verifiable, on the ground changes in biodiversity. Similarly, water emissions may lead to verifiable changes in the state of freshwater ecosystems which can be attributed solely to your company, for instance when streams or wetlands are wholly contained within its direct operations or where it is the only significant polluter within the catchment."

⁵ The value chain boundaries of the BD Protocol differ from the three scopes of the GHG Protocol. In line with the Natural Capital Protocol (Natural Capital Coalition 2016, the BD Protocol first recognises three major parts of the value chain:

- Direct operations (gate-to-gate), which cover activities over which your business holds ownership or control;
- Upstream (cradle-to-gate), which covers the activities of suppliers;
- Downstream (gate-to-grave), which covers activities linked to the purchase, use, re-use, recovery, recycling, and final disposal of your business' products and services.

In other words, building Sibanye-Stillwater's biodiversity impact inventory meant listing the ecosystem types and taxa (species and sub-species) that Sibanye-Stillwater interacts with at each site. Two main direct impact drivers were identified to that end: land use and water emissions.

The direct operational footprint of operations was supplied by Sibanye-Stillwater. No verification was undertaken. For any eventual assurance process, the title deeds of owned and leased landholdings would need to be checked.⁶ With respect to water emissions, direct impacts on wetlands (i.e. spatial footprints of water emissions from Sibanye-Stillwater) were assessed through the analysis of specialist reports and satellite imagery where available. Further site surveys will be required at some sites and Sibanye-Stillwater has started addressing gaps and uncertainties noted through the 2021 assessment process.

Full methodological details (e.g., complete asset registers, journal entries, statements of performance and position) are available in the individual reports for each operation, listed in alphabetical order as follows:

- Houdet, J., Teren, G., 2022. Sibanye-Stillwater's biodiversity footprint. Pilot assessment as per the Biological Diversity protocol: **Beatrix**. National Biodiversity & Business Network – Endangered Wildlife Trust / Sibanye-Stillwater;
- Houdet, J., Teren, G., 2022. Sibanye-Stillwater's biodiversity footprint. Pilot assessment as per the Biological Diversity protocol: **Blueridge**. National Biodiversity & Business Network – Endangered Wildlife Trust / Sibanye-Stillwater;
- Houdet, J., Teren, G., 2022. Sibanye-Stillwater's biodiversity footprint. Pilot assessment as per the Biological Diversity protocol: **Burnstone**. National Biodiversity & Business Network – Endangered Wildlife Trust / Sibanye-Stillwater;
- Houdet, J., Teren, G., 2022. Sibanye-Stillwater's biodiversity footprint. Pilot assessment as per the Biological Diversity protocol: **Driefontein**. National Biodiversity & Business Network – Endangered Wildlife Trust / Sibanye-Stillwater;

⁶ This process is typically undertaken as part of the standard legal requirements for the environmental licenses which Sibanye-Stillwater holds for its respective operations.

- Houdet, J., Teren, G., 2022. Sibanye-Stillwater's biodiversity footprint. Pilot assessment as per the Biological Diversity protocol: **Ezulwini**. National Biodiversity & Business Network – Endangered Wildlife Trust / Sibanye-Stillwater;
- Houdet, J., Teren, G., 2022. Sibanye-Stillwater's biodiversity footprint. Pilot assessment as per the Biological Diversity protocol: **Kloof**. National Biodiversity & Business Network – Endangered Wildlife Trust / Sibanye-Stillwater;
- Houdet, J., Teren, G., 2022. Sibanye-Stillwater's biodiversity footprint. Pilot assessment as per the Biological Diversity protocol: **Kroondal**. National Biodiversity & Business Network – Endangered Wildlife Trust / Sibanye-Stillwater;
- Houdet, J., Teren, G., 2022. Sibanye-Stillwater's biodiversity footprint. Pilot assessment as per the Biological Diversity protocol: **Marikana**. National Biodiversity & Business Network – Endangered Wildlife Trust / Sibanye-Stillwater;
- Houdet, J., Teren, G., 2022. Sibanye-Stillwater's biodiversity footprint. Pilot assessment as per the Biological Diversity protocol: **Rand Uranium**. National Biodiversity & Business Network – Endangered Wildlife Trust / Sibanye-Stillwater;
- Houdet, J., Teren, G., 2022. Sibanye-Stillwater's biodiversity footprint. Pilot assessment as per the Biological Diversity protocol: **Rand Platinum Mines**. National Biodiversity & Business Network – Endangered Wildlife Trust / Sibanye-Stillwater;
- KC Harvey Environmental, LLC, 2021. Biodiversity Impact Assessment. **US PGM Operations**.

4.2.1 Ecosystem impact inventory

For impacts on ecosystems, key input data include:

- Extent of ecosystem assets, including transformed areas using historical data (e.g., historical vegetation maps); expressed in surface area metrics (i.e. hectares in SA and acres in USA operations (converted to hectares for alignment purposes)).
- The state of these ecosystem assets, as per various condition or integrity rating methods; expressed in surface area adjusted for condition metrics (i.e. hectares equivalents in SA and acres equivalents in USA operations).

Furthermore, it is important to understand that various ecosystem or habitat condition or integrity rating methods are available throughout the world. Some may only be appropriate

for specific ecosystems (e.g., Wet-Health methodology⁷ for wetland ecosystems in SA), depending on the context and the best available science. Conversion tables are used to:

- Convert scores from various condition or integrity rating methods into numerical values (e.g., Wet-Health present state categories or scores range from A to F), ranging from 0 (completely transformed) to an appropriate maximum value (reference or pristine state),
- Adjust ecosystem asset surface areas for their condition or integrity (i.e. multiplying extent by the assessed condition / integrity value divided by the reference / pristine state value) (i.e. hectares equivalents in SA and acres equivalents in USA operations),
- Convert these different metrics of surface areas adjusted for condition / integrity into a single metric for group level consolidation purpose, in this case hectares equivalents (Ha eq.) and
- Sum them up to show the positive biodiversity footprint of Sibanye-Stillwater, which can also be expressed as a percentage of the total biodiversity footprint (see section 3.3 for more information on the total, negative and positive biodiversity footprints).

4.2.2 Species impact inventory

As per the BD Protocol, not all species should be included in the impact inventory, only priority species for the business context. This process was completed only for USA operations at this stage, as only potentially material species were identified for SA operations. For USA operations, it involved rating the species as per five criteria: 1) conservation status, 2) potential to occur, (3) ease of assessment, (4) likelihood of impacts and (5) severity of impacts⁸. The sum of individual species scores determined the importance of the species in the context of US operations while a threshold score (superior to 10) defined the species eventually included in the impact inventory.

Once material species are determined, it is important to note that key input data include (alongside corresponding GIS data) either:

- The actual and target⁹ population size of each material species (expressed in numbers, such as numbers of breeding individuals or breeding pairs), or

⁷ Macfarlane, D. M., Kotze, D. C., Ellery, W. N., Walters, D., Koopman, V., Goodman, P., et al. (2008). WET-Health: a technique for rapidly assessing wetland health. WRC report TT340/08. South Africa: WRC, 176p.

⁸ See table B-1 in KC Harvey Environmental, LLC, 2021. Biodiversity Impact Assessment. US PGM Operations.

⁹ The target population size of a species depends on the threat status and the business context.

- The actual and target¹⁰ habitat size of each material species (expressed in surface area metrics, such as acres or hectares).

This choice of method and metric will depend on the species and context, notably monitoring costs.

4.3 Accounting for net biodiversity impacts

Biodiversity accounting is the systematic process of identifying, measuring, recording, summarising and reporting the periodic and accumulated net changes to the biophysical state of biodiversity assets. It requires:

- Developing an asset inventory comprised of ecosystems and material species,
- Employing measurement techniques that use spatially explicit data,
- Measuring net change (gains minus losses) in each asset category by applying the principle of ecological equivalency (like-for-like),
- Using recording rules based on double-entry bookkeeping from financial accounting,
- Compiling asset-specific biophysical statements of performance and position,
- Distinguishing accounts according to organisational and value chain boundaries.

Detailed accounting rules are presented in section 3.3 of the BD Protocol. Here are the highlights:

Any change, positive or negative, in the biodiversity impact inventory needs to be accounted for. The BD Protocol builds from the foundations of financial accounting through two simple equations, adapted from double entry bookkeeping, which ensures that the total biodiversity impacts of a company are equal to the sum of its accumulated positive and negative impacts¹¹. Accounting for net biodiversity impacts thus revolves around the following equations:

¹⁰ The target habitat size of a species depends on the threat status and the business context.

¹¹ See theoretical foundations in Houdet, J., Ding H., Quétier F., Addison, P.F.E., Deshmukh, P. (2020). Adapting double-entry bookkeeping to renewable natural capital: an application to corporate net biodiversity impact accounting and disclosure. *Ecosystem Services* 45, 101104, ISSN 2212-0416, <https://doi.org/10.1016/j.ecoser.2020.101104>

- Statement of Biodiversity Position: (A accounts) total impacts on biodiversity features = (B accounts) accumulated positive impacts on biodiversity + (C accounts) accumulated negative impacts on biodiversity (for all periods to date);
- Statement of Biodiversity Performance: (X accounts) net biodiversity impacts on biodiversity features over the accounting period = (Y accounts) periodic positive biodiversity impacts or gains - (Z accounts) periodic biodiversity negative impacts or losses.

The Biodiversity Accounting Framework of the BD Protocol recognises six main biodiversity-related account categories, namely:

- Asset accounts: Accounts in the Statement of Biodiversity Position equation (A), representing the total biodiversity impacts on each feature of the biodiversity impact inventory of your organisation;
- Accumulated positive impact accounts: Accounts in the Statement of Biodiversity Position equation (B), representing the accumulated positive impacts on each feature of the biodiversity impact inventory of your organisation, though not necessarily implying actual conservation measures. This could be presented as the biodiversity contributions to society of your business;
- Accumulated negative impact accounts: Accounts in the Statement of Biodiversity Position equation (C), representing the accumulated negative impacts on each feature of the biodiversity impact inventory of your organisation, with no financial liability implied;
- Net impact accounts: Accounts in the Statement of Biodiversity Performance equation (X), representing the net impacts (gains minus losses) on each feature of the biodiversity impact inventory of your organisation in the reporting period.
- Gain accounts: Accounts in the Statement of Biodiversity Performance equation (Y), representing the gains for each feature of the biodiversity impact inventory of your organisation in the reporting period;
- Loss accounts: Accounts in the Statement of Biodiversity Performance equation (Z), representing the losses for each feature of the biodiversity impact inventory of your organisation in the reporting period.

Furthermore, key concepts for impacts on ecosystems include:

- Total Biodiversity Footprint = sum of surface areas of ecosystems within the impact inventory (not assessed for condition; hence it would be equal to the reference or pristine state of all surface areas).
- Positive Biodiversity Footprint = sum of surface areas adjusted for condition.
- Negative Biodiversity Footprint = difference or gap between the Total Biodiversity Footprint (reference or pristine state of all surface areas) and the Positive Biodiversity Footprint (surface areas adjusted for condition).

Finally, key concepts for impacts on species include:

- Total Biodiversity Footprint = target population / habitat size within impact inventory.
- Positive Biodiversity Footprint = current population / habitat size.
- Negative Biodiversity Footprint = the difference or gap between its current population / habitat size and the target / ideal population / habitat size (as determined by science and business context).

4.4 Net impact modelling as per relevant scenarios informed by Sibanye-Stillwater's biodiversity policy and development plans

Sibanye-Stillwater's Biodiversity Position Statement defines its approach to biodiversity management: *"Our biodiversity vision is based on achieving a "no net loss" for new/greenfield operations and a "net gain" in biodiversity for existing operations through the effective implementation and integration of the mitigation hierarchy into all levels of decision making and project planning to ensure a sustainable post-mining environment that supports socio-economic development."* For existing operations, a "net gain" approach applies to impacts which have occurred under Sibanye-Stillwater's control. This baseline date will differ according to each operation (i.e. their date of acquisition). Draft scenarios were developed for all SA and USA operations, as detailed in individual mine reports (see full references in section 3.2). In summary, the SA operations have committed to net gain as they were largely developed prior to Sibanye-Stillwater's ownership, while the US Operations commit to no net loss since Stillwater managed the activities since the commencement of mining.

5. Results: The Biodiversity Footprint of Sibanye-Stillwater

This section focuses on compiling group-level results for impacts on ecosystems:

- Consolidated Biodiversity Footprint,
- Biodiversity Footprint broken down per operation,
- Biodiversity Footprint broken down per ecosystem.

These are *draft accounts*, produced exclusively from desktop analysis. The development of site-based ecosystem condition monitoring protocols in the future will enable their verification, notably for progress monitoring towards appropriate biodiversity targets.

Details for each mining operation (e.g., complete ecosystem asset register, maps, accounting journal entries) are available in the reports listed in section 3.2. For SA operations, the Biodiversity Footprint assessment of Sibanye-Stillwater is currently limited to its ecosystem impact inventory. Please refer to the USA operations report¹² for details on their draft species accounts.

5.1 Consolidated Biodiversity Footprint

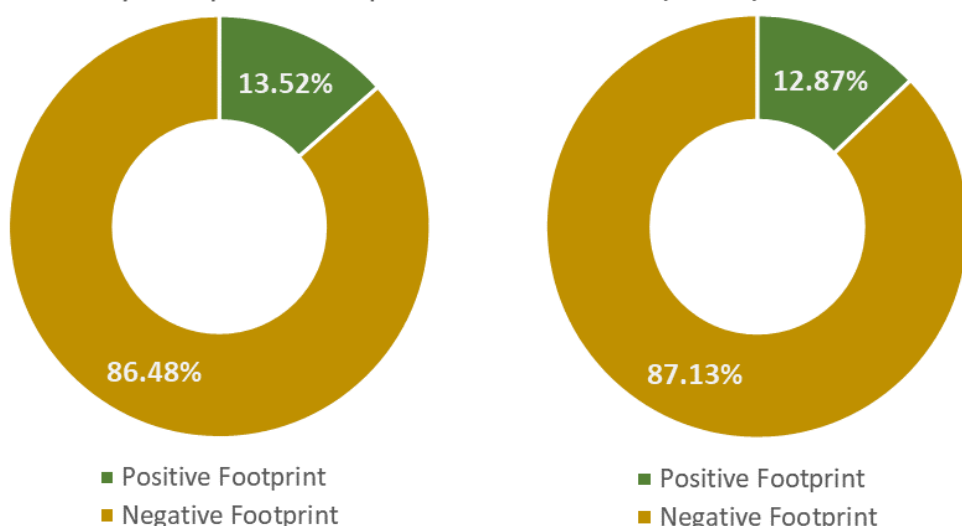
Table 1 presents the Total Biodiversity Footprint (TBF), Positive Biodiversity Footprint (PBF) and Negative Biodiversity Footprint (NBF) of Sibanye-Stillwater (a) at acquisition and (b) currently at time of assessment. Overall, the Total Biodiversity Footprint of Sibanye-Stillwater was 49 913,71 Ha at date of acquisition of various assets, with around 86% of Negative Biodiversity Footprint (43 160,26 Ha eq.) and 14% of Positive Biodiversity Footprint (6 753,45 Ha eq.). At the time of assessment (current state in 2020 / 2021), the Total Biodiversity Footprint increased to 49 928,30 Ha, with around 87% of Negative Biodiversity Footprint (43 504,18 Ha eq.) and 13% of Positive Biodiversity Footprint (6 424,12 Ha eq.).

¹² KC Harvey Environmental, LLC, 2021. Biodiversity Impact Assessment. US PGM Operations.

Table 1: The consolidated Total Biodiversity Footprint (TBF), Positive Biodiversity Footprint (PBF) and Negative Biodiversity Footprint (NBF) of Sibanye-Stillwater (a) at acquisition and (b) currently at time of assessment

At acquisition (different dates)	Total Biodiversity Footprint (TBF, in Ha)	49897,41
	Percentage of TBF / TBF (%)	100,00%
	Positive Biodiversity Footprint (PBF, in Ha eq.)	6745,78
	Percentage of PBF / TBF (%)	13,52%
	Negative Biodiversity Footprint (NBF, in Ha eq.)	43151,64
	Percentage of NBF / NBF (%)	86,48%
Current state after management takeover (2021)	Total Biodiversity Footprint (TBF, in Ha)	49912,01
	Percentage of TBF (%)	100,00%
	Positive Biodiversity Footprint (PBF, in Ha eq.)	6422,68
	Percentage of PBF / TBF (%)	12,87%
	Negative Biodiversity Footprint (NBF, in Ha eq.)	43489,32
	Percentage of NBF / NBF (%)	87,13%

Biodiversity Footprint at acquisition Biodiversity Footprint at assesment



5.2 Biodiversity Footprint broken down per operation

In this section, the Total Biodiversity Footprint (TBF), Positive Biodiversity Footprint (PBF) and Negative Biodiversity Footprint (NBF) of Sibanye-Stillwater (a) at acquisition and (b) currently at the time of assessment is broken down per operation (and in some case sub-units as is the case for Beatrix, Driefontein and Kloof). The maps of the ecosystem extent and condition for each operation is available in the annexes of this report.

For SA operations, Table 2 and Figure 1 show this break down at acquisition while Table 3 and Figure 2 present the results at the time of this assessment. While Marikana has, by far, the largest TBF (11 472,55 Ha), Blue Ridge has the largest proportion of PBF (38,58% of the TBF) and several sites have NBF representing more than 90% of their TBF (Beatrix, Ezulwini, Kloof, Kroondal, Rand Uranium and RPM).

For USA operations, Table 4 presets the TBF, PBF and NBF (a) at acquisition and (b) currently at time of the assessment for each operation. Figure 3 shows this breakdown at acquisition and Figure 4 at the time of assessment. Stillwater Mine has the largest TBF (1 296,05 Ha) and highest PBF both (a) at acquisition (92,38% of the TBF) and (b) at time of assessment (74,09% of the TBF).

Table 2: The Total Biodiversity Footprint (TBF), Positive Biodiversity Footprint (PBF) and Negative Biodiversity Footprint (NBF) of SA operations at acquisition

Operation	At acquisition (different dates)					
	Total Biodiversity Footprint (TBF, in Ha)	Percentage of TBF / TBF (%)	Positive Biodiversity Footprint (PBF, in Ha eq.)	Percentage of PBF / TBF (%)	Negative Biodiversity Footprint (NBF, in Ha eq.)	Percentage of NBF / NBF (%)
Beatrix	6694,08	100,00%	640,81	9,57%	6053,27	90,43%
Blue Ridge	1085,54	100,00%	418,80	38,58%	666,74	61,42%
Burnstone	1031,25	100,00%	212,83	20,64%	818,42	79,36%
Driefontein	9262,85	100,00%	1343,01	14,50%	7919,85	85,50%
Ezulwini	870,14	100,00%	49,19	5,65%	820,95	94,35%
Kloof	5866,92	100,00%	563,85	9,61%	5303,07	90,39%
Kroondal	686,04	100,00%	45,79	6,67%	640,25	93,33%
Marikana	11472,55	100,00%	1181,35	10,30%	10291,19	89,70%
Rand Uranium	5952,38	100,00%	292,15	4,91%	5660,23	95,09%
RPM	5262,91	100,00%	438,42	8,33%	4824,50	91,67%

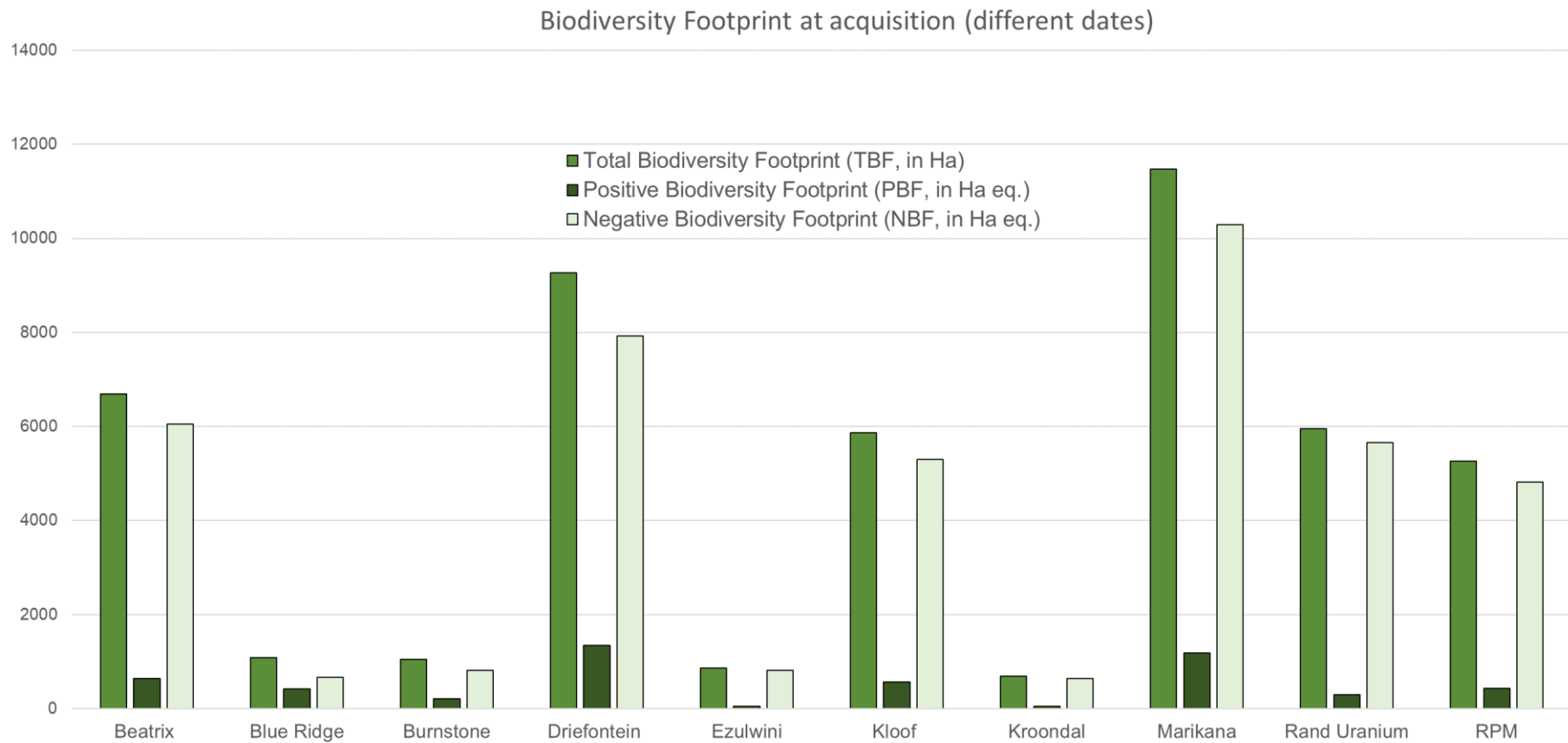


Figure 1: The Total Biodiversity Footprint (TBF), Positive Biodiversity Footprint (PBF) and Negative Biodiversity Footprint (NBF) of SA operations at acquisition

Table 3: The Total Biodiversity Footprint (TBF), Positive Biodiversity Footprint (PBF) and Negative Biodiversity Footprint (NBF) of SA operations at time of assessment

Operation	Current state after management takeover (late 2021)					
	Total Biodiversity Footprint (TBF, in Ha)	Percentage of TBF / TBF (%)	Positive Biodiversity Footprint (PBF, in Ha eq.)	Percentage of PBF / TBF (%)	Negative Biodiversity Footprint (NBF, in Ha eq.)	Percentage of NBF / NBF (%)
Beatrix	6694,08	100,00%	640,81	9,57%	6053,27	90,43%
Blue Ridge	1085,54	100,00%	418,80	38,58%	666,74	61,42%
Burnstone	1045,85	100,00%	213,65	20,43%	832,21	79,57%
Driefontein	9262,85	100,00%	1343,01	14,50%	7919,85	85,50%
Ezulwini	870,14	100,00%	49,19	5,65%	820,95	94,35%
Kloof	5866,92	100,00%	563,85	9,61%	5303,07	90,39%
Kroondal	686,04	100,00%	45,79	6,67%	640,25	93,33%
Marikana	11472,55	100,00%	1181,35	10,30%	10291,19	89,70%
Rand Uranium	5952,38	100,00%	292,15	4,91%	5660,23	95,09%
RPM	5262,91	100,00%	438,42	8,33%	4824,50	91,67%

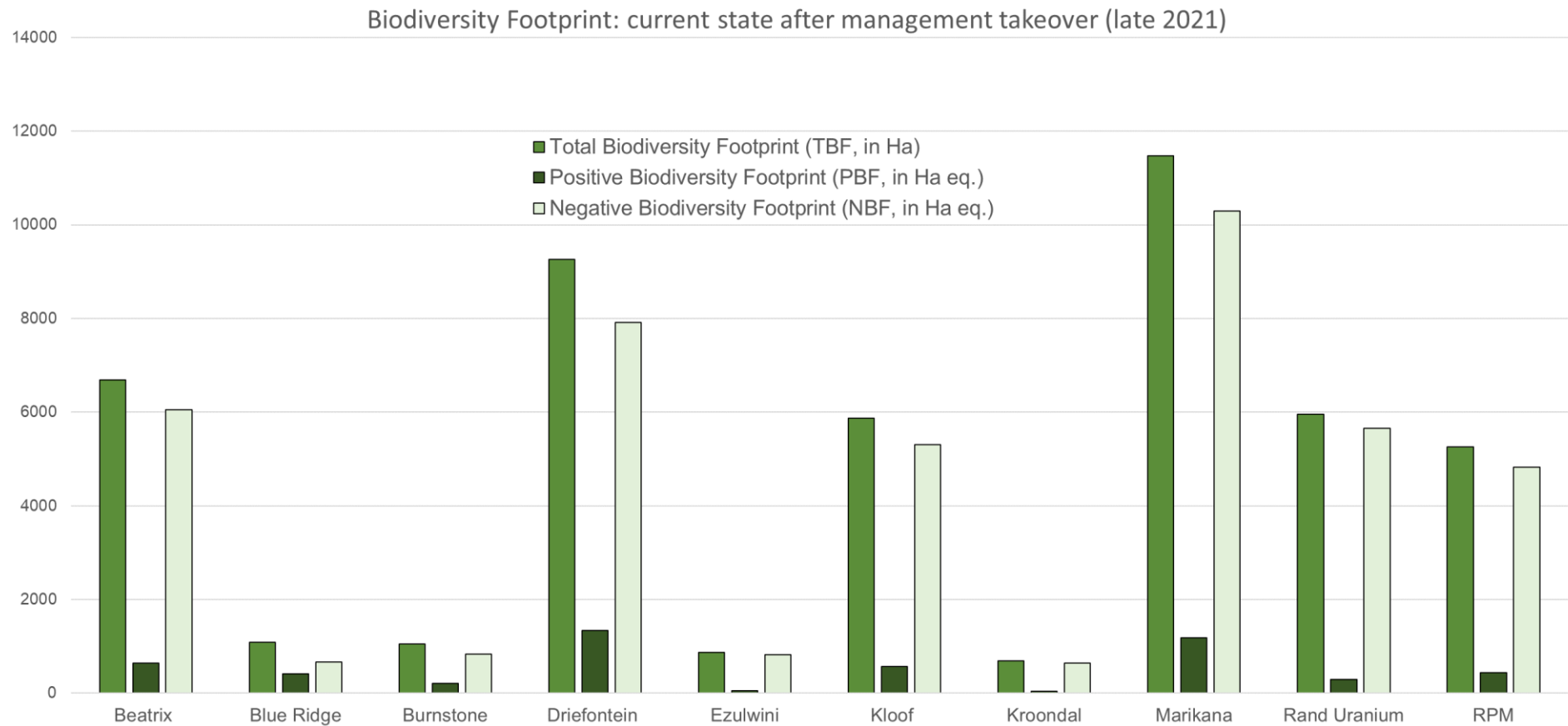


Figure 2: The Total Biodiversity Footprint (TBF), Positive Biodiversity Footprint (PBF) and Negative Biodiversity Footprint (NBF) of SA operations at time of assessment

Table 4: The Total Biodiversity Footprint (TBF), Positive Biodiversity Footprint (PBF) and Negative Biodiversity Footprint (NBF) of USA operations (a) at acquisition and (b) at time of assessment

		East Boulder Mine (EBM)	Stillwater Mine (SWM)
At acquisition (different dates)	Total Biodiversity Footprint (TBF, in Ha)	416,70	1296,05
	Percentage of TBF / TBF (%)	100,00%	100,00%
	Positive Biodiversity Footprint (PBF, in Ha eq.)	362,25	1197,33
	Percentage of PBF / TBF (%)	86,93%	92,38%
	Negative Biodiversity Footprint (NBF, in Ha eq.)	54,45	98,72
	Percentage of NBF / NBF (%)	13,07%	7,62%
Current state after management takeover (2021)	Total Biodiversity Footprint (TBF, in Ha)	416,70	1296,04
	Percentage of TBF (%)	100,00%	100,00%
	Positive Biodiversity Footprint (PBF, in Ha eq.)	275,40	960,27
	Percentage of PBF / TBF (%)	66,09%	74,09%
	Negative Biodiversity Footprint (NBF, in Ha eq.)	141,30	335,77
	Percentage of NBF / NBF (%)	33,91%	25,91%

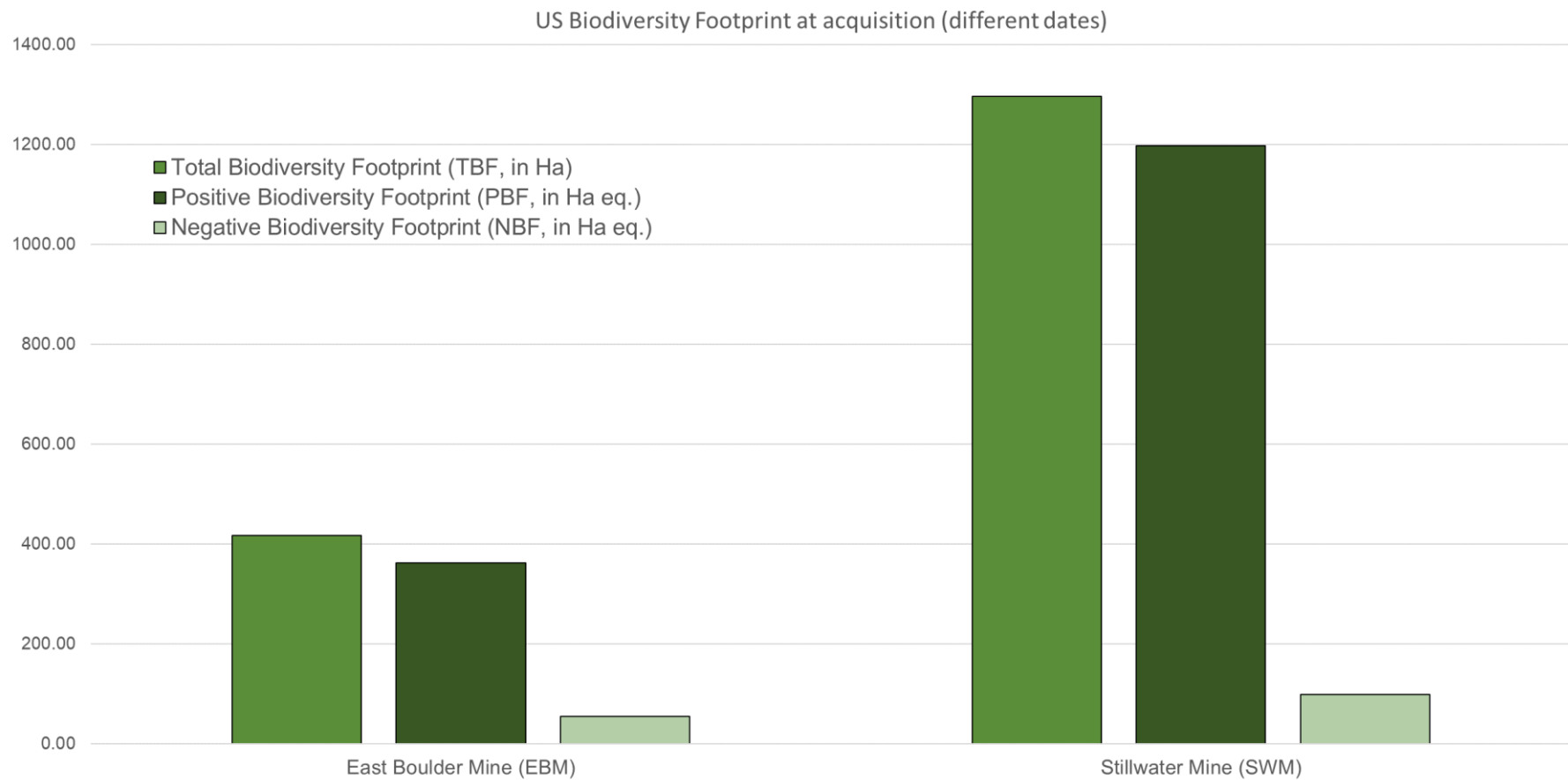


Figure 3: The Total Biodiversity Footprint (TBF), Positive Biodiversity Footprint (PBF) and Negative Biodiversity Footprint (NBF) of USA operations at acquisition

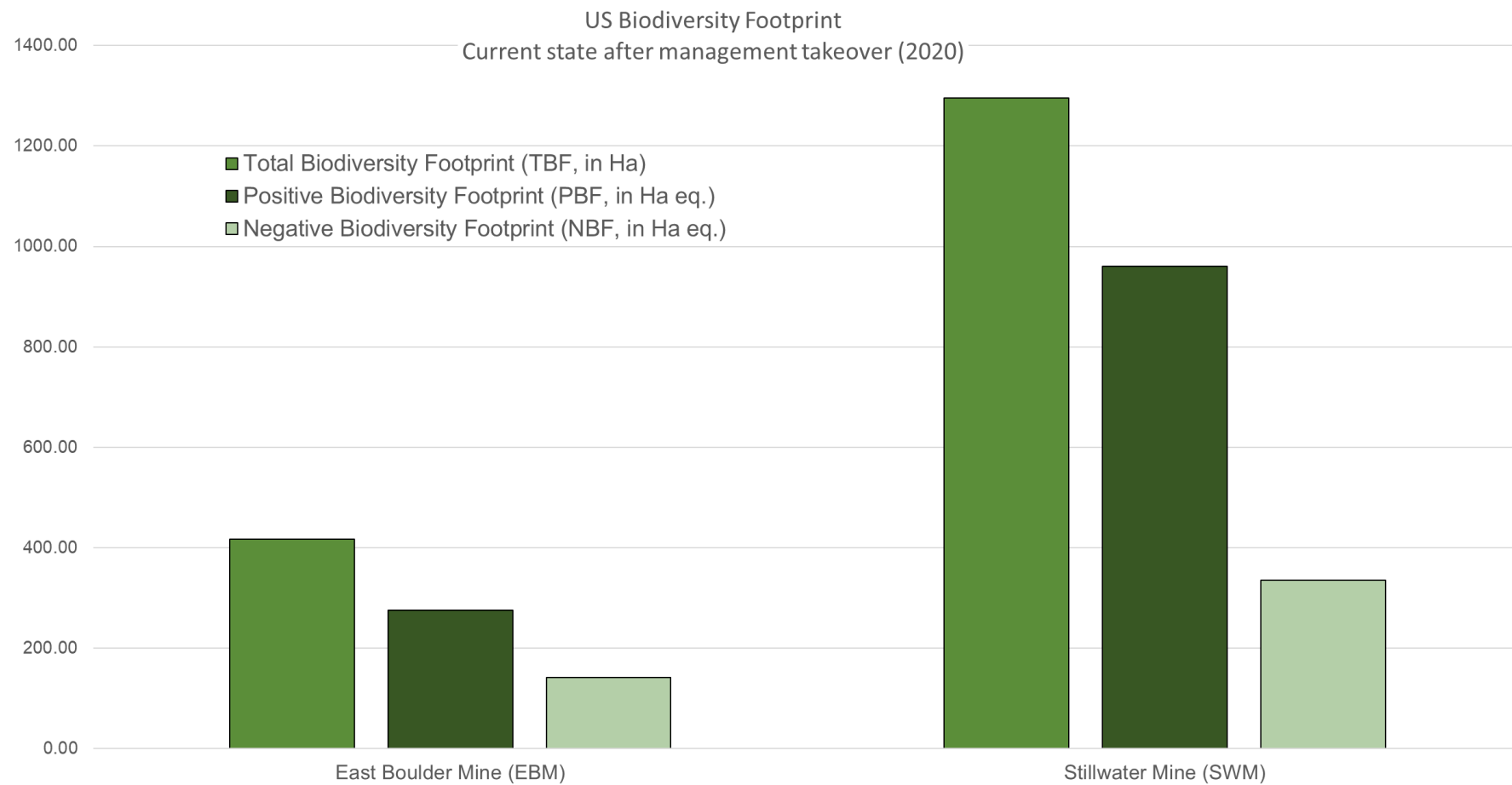


Figure 4: The Total Biodiversity Footprint (TBF), Positive Biodiversity Footprint (PBF) and Negative Biodiversity Footprint (NBF) of USA operations at time of assessment

5.3 Biodiversity Footprint broken down per ecosystem

In this section, the Total Biodiversity Footprint (TBF), Positive Biodiversity Footprint (PBF) and Negative Biodiversity Footprint (NBF) of Sibanye-Stillwater (a) at acquisition and (b) currently at the time of assessment is broken down per ecosystem asset category. This breakdown is critical to understand the impacts of Sibanye-Stillwater on biodiversity, as it helps inform decision-making for each ecosystem asset at the group level (i.e. several sites hold the same ecosystem types).

For SA operations, Table 5 shows this break down (a) at acquisition and (b) currently at the time of assessment. Figures 5 and 6 show these results, respectively, a) at acquisition and (b) currently at the time of assessment. While the Marikana Thornveld has the biggest TBF (14 472,54 Ha), Loskop Mountain Bushveld Wetland and Loskop Thornveld Wetland ecosystems hold the largest proportion of PBF (60,00% of the TBF) and the Gold Reef Mountain Bushveld ecosystem the lowest (0% of the TBF) at the time of assessment. Out of the 24 ecosystem types, 6 are threatened as per the National List of Threatened Ecosystems¹³: Marikana Thornveld (VU) and Marikana Thornveld Wetland (VU), of which 55% is remaining natural area and 0% of original area (253 000 ha) protected; Soweto Highveld Grassland (VU), and Soweto Highveld Grassland Wetland (VU) of which 54% is remaining natural area and 0% of original area (1 451 000 ha) protected; Vaal-Vet Sandy Grassland (EN), and Vaal-Vet Sandy Grassland Wetlands (EN) of which 36% is remaining natural area, and less than 1% of original area (2 274 000 ha) protected.

For USA operations, Table 6 presets the TBF, PBF and NBF (a) at acquisition and (b) currently at time of the assessment per ecosystem asset category. Figure 7 shows this breakdown at acquisition and Figure 8 at the time of assessment. While the Rocky Mountain Lower Montane, Foothill, and Valley Grassland ecosystem has the largest TBF (699,88 Ha), most other ecosystem assets have a proportion of PBF superior to 80,00% of the TBF.

¹³ The National List of Threatened Ecosystems for South Africa (2011) (National Gazette No 34809 of 9 December, 2011).

Table 5: The Total Biodiversity Footprint (TBF), Positive Biodiversity Footprint (PBF) and Negative Biodiversity Footprint (NBF) of SA operations (a) at acquisition and (b) at time of assessment, broken down per ecosystem asset (1/2)

		Carletonville Dolomite Grassland	Carletonville Dolomite Grassland Wetland	Central Free State Grassland Wetlands	Gauteng Shale Mountain Bushveld	Gauteng Shale Mountain Bushveld Wetland	Gold Reef Mountain Bushveld	Highveld Alluvial Vegetation	Highveld Alluvial Vegetation Wetlands
At acquisition (different dates)	Total Biodiversity Footprint (TBF, in Ha)	8915,86	1055,49	306,24	5561,27	686,13	10,92	441,79	246,22
	Percentage of TBF / TBF (%)	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%
	Positive Biodiversity Footprint (PBF, in Ha eq.)	676,16	317,24	96,85	622,80	204,21	0,00	49,78	55,42
	Percentage of PBF / TBF (%)	7,58%	30,06%	31,63%	11,20%	29,76%	0,00%	11,27%	22,51%
	Negative Biodiversity Footprint (NBF, in Ha eq.)	8239,70	738,26	209,39	4938,47	481,92	10,92	392,02	190,81
	Percentage of NBF / NBF (%)	92,42%	69,94%	68,37%	88,80%	70,24%	100,00%	88,73%	77,49%
Current state after management takeover (late 2021)	Total Biodiversity Footprint (TBF, in Ha)	8915,86	1055,49	306,24	5561,27	686,13	10,92	441,79	246,22
	Percentage of TBF (%)	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%
	Positive Biodiversity Footprint (PBF, in Ha eq.)	676,16	317,24	96,85	622,80	204,21	0,00	49,78	55,42
	Percentage of PBF / TBF (%)	7,58%	30,06%	31,63%	11,20%	29,76%	0,00%	11,27%	22,51%
	Negative Biodiversity Footprint (NBF, in Ha eq.)	8239,70	738,26	209,39	4938,47	481,92	10,92	392,02	190,81
	Percentage of NBF / NBF (%)	92,42%	69,94%	68,37%	88,80%	70,24%	100,00%	88,73%	77,49%
		Highveld Salt Pan	Loskop Mountain Bushveld	Loskop Mountain Bushveld Wetland	Loskop Thornveld	Loskop Thornveld Wetland	Marikana Thornveld	Marikana Thornveld Wetland	Moot Plains Bushveld
At acquisition (different dates)	Total Biodiversity Footprint (TBF, in Ha)	556,69	382,27	158,24	470,93	74,10	14742,54	1299,94	1357,17
	Percentage of TBF / TBF (%)	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%
	Positive Biodiversity Footprint (PBF, in Ha eq.)	115,77	137,06	94,94	142,33	44,46	1122,82	471,53	66,83
	Percentage of PBF / TBF (%)	20,80%	35,85%	60,00%	30,22%	60,00%	7,62%	36,27%	4,92%
	Negative Biodiversity Footprint (NBF, in Ha eq.)	440,93	245,22	63,30	328,59	29,64	13619,72	828,41	1290,34
	Percentage of NBF / NBF (%)	79,20%	64,15%	40,00%	69,78%	40,00%	92,38%	63,73%	95,08%
Current state after management takeover (late 2021)	Total Biodiversity Footprint (TBF, in Ha)	556,69	382,27	158,24	470,93	74,10	14742,54	1299,94	1357,17
	Percentage of TBF (%)	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%
	Positive Biodiversity Footprint (PBF, in Ha eq.)	115,77	137,06	94,94	142,33	44,46	1122,82	471,53	66,83
	Percentage of PBF / TBF (%)	20,80%	35,85%	60,00%	30,22%	60,00%	7,62%	36,27%	4,92%
	Negative Biodiversity Footprint (NBF, in Ha eq.)	440,93	245,22	63,30	328,59	29,64	13619,72	828,41	1290,34
	Percentage of NBF / NBF (%)	79,20%	64,15%	40,00%	69,78%	40,00%	92,38%	63,73%	95,08%

Table 5: The Total Biodiversity Footprint (TBF), Positive Biodiversity Footprint (PBF) and Negative Biodiversity Footprint (NBF) of SA operations (a) at acquisition and (b) at time of assessment, broken down per ecosystem asset (2/2)

		Moot Plains Bushveld Wetland	Rand Highveld Grassland	Rand Highveld Grassland Wetland	Soweto Highveld Grassland	Soweto Highveld Grassland Wetland	Vaal-Vet Sandy Grassland	Vaal-Vet Sandy Grassland Wetlands	Western Free State Clay Grassland
At acquisition (different dates)	Total Biodiversity Footprint (TBF, in Ha)	10,93	2756,59	416,70	2986,85	604,66	4717,93	19,90	405,31
	Percentage of TBF / TBF (%)	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%
	Positive Biodiversity Footprint (PBF, in Ha eq.)	4,37	176,78	166,68	59,46	237,70	229,13	3,98	89,89
	Percentage of PBF / TBF (%)	40,00%	6,41%	40,00%	1,99%	39,31%	4,86%	20,00%	22,18%
	Negative Biodiversity Footprint (NBF, in Ha eq.)	6,56	2579,81	250,02	2927,39	366,96	4488,80	15,92	315,41
	Percentage of NBF / NBF (%)	60,00%	93,59%	60,00%	98,01%	60,69%	95,14%	80,00%	77,82%
Current state after management takeover (late 2021)	Total Biodiversity Footprint (TBF, in Ha)	10,93	2756,59	416,70	2986,85	619,26	4717,93	19,90	405,31
	Percentage of TBF (%)	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%
	Positive Biodiversity Footprint (PBF, in Ha eq.)	4,37	176,78	166,68	59,46	238,52	229,13	3,98	89,89
	Percentage of PBF / TBF (%)	40,00%	6,41%	40,00%	1,99%	38,52%	4,86%	20,00%	22,18%
	Negative Biodiversity Footprint (NBF, in Ha eq.)	6,56	2579,81	250,02	2927,39	380,74	4488,80	15,92	315,41
	Percentage of NBF / NBF (%)	60,00%	93,59%	60,00%	98,01%	61,48%	95,14%	80,00%	77,82%

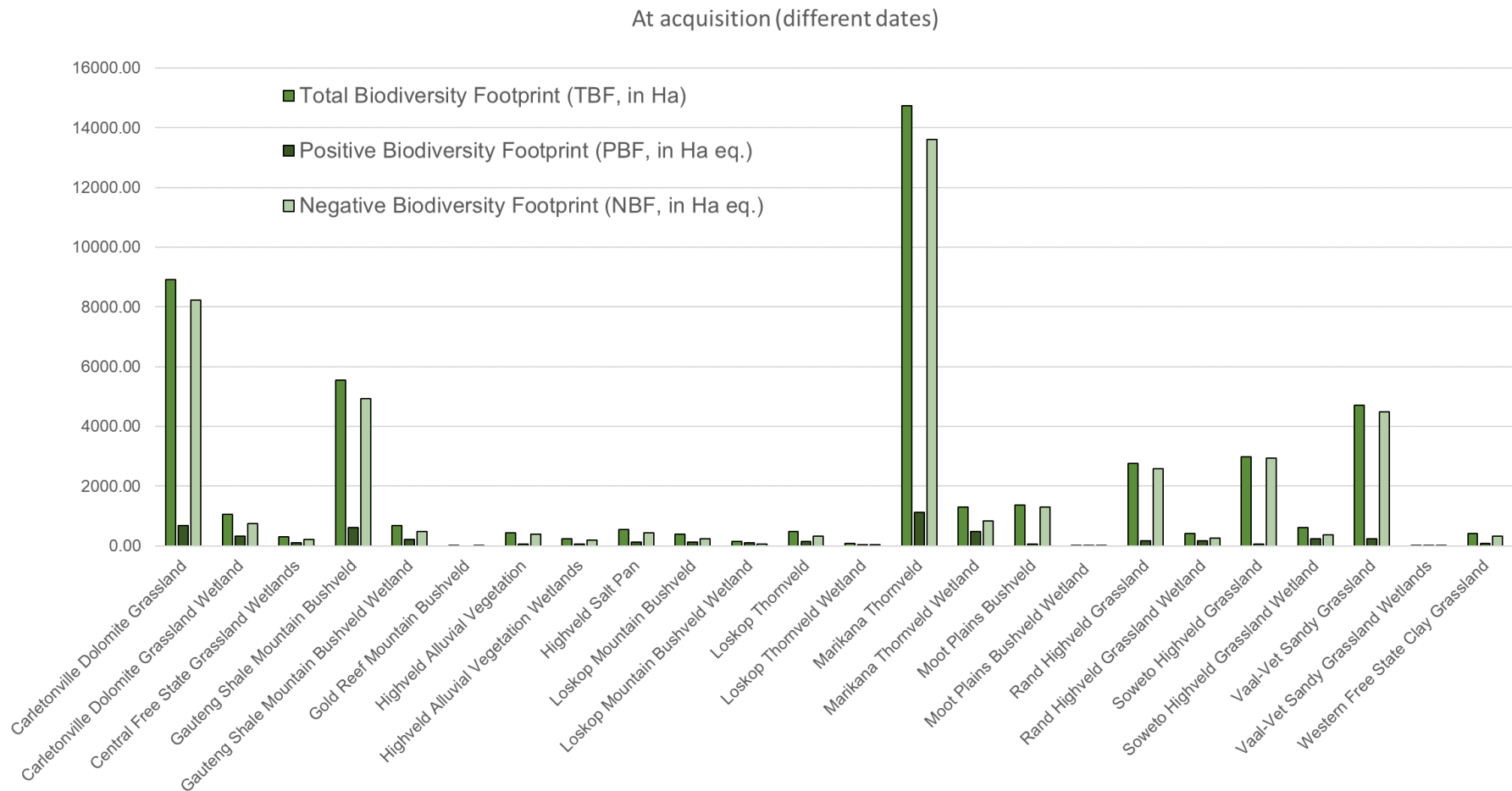


Figure 5: The Total Biodiversity Footprint (TBF), Positive Biodiversity Footprint (PBF) and Negative Biodiversity Footprint (NBF) of SA operations at acquisition, broken down per ecosystem asset

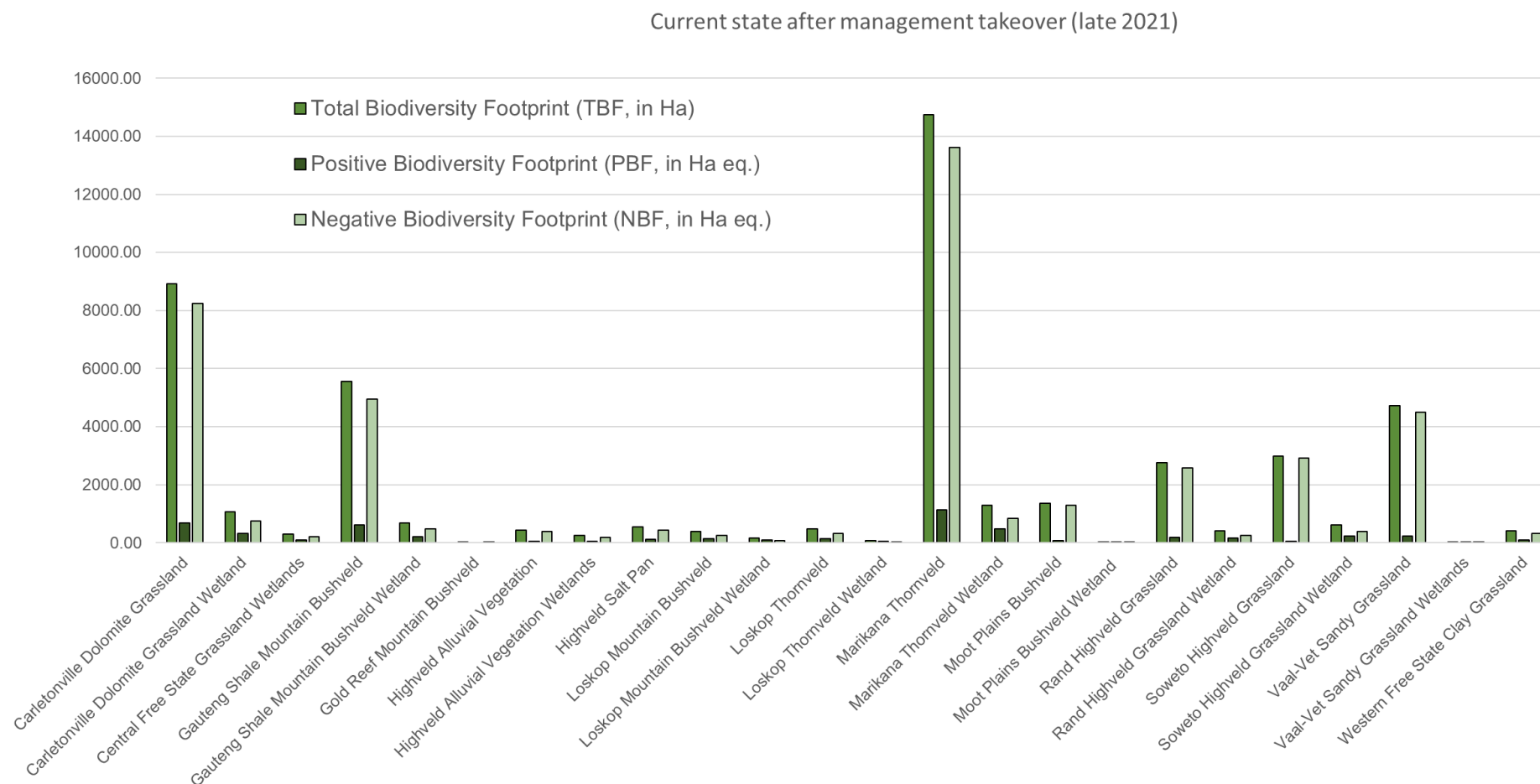


Figure 6: The Total Biodiversity Footprint (TBF), Positive Biodiversity Footprint (PBF) and Negative Biodiversity Footprint (NBF) of SA operations at time of assessment, broken down per ecosystem asset

Table 6: The Total Biodiversity Footprint (TBF), Positive Biodiversity Footprint (PBF) and Negative Biodiversity Footprint (NBF) of USA operations (a) at acquisition and (b) at time of assessment, broken down per ecosystem asset

		Alpine-Montane Wet Meadow	Aspen Forest and Woodland	Big Sagebrush Steppe	Montane Sagebrush Steppe	Open Water	Rocky Mountain Cliff, Canyon and Massive Bedrock
At acquisition (different dates)	Total Biodiversity Footprint (TBF, in Ha)	1,28	48,16	3,82	162,98	3,40	20,99
	Percentage of TBF / TBF (%)	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%
	Positive Biodiversity Footprint (PBF, in Ha eq.)	1,06	47,08	3,82	141,68	3,39	20,61
	Percentage of PBF / TBF (%)	83,10%	97,77%	100,00%	86,93%	99,64%	98,19%
	Negative Biodiversity Footprint (NBF, in Ha eq.)	0,22	1,08	0,00	21,30	0,01	0,38
	Percentage of NBF / NBF (%)	16,90%	2,23%	0,00%	13,07%	0,36%	1,81%
Current state after management takeover (2021)	Total Biodiversity Footprint (TBF, in Ha)	1,28	48,16	3,82	162,98	3,40	20,99
	Percentage of TBF (%)	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%
	Positive Biodiversity Footprint (PBF, in Ha eq.)	1,06	46,87	3,33	141,29	3,39	19,96
	Percentage of PBF / TBF (%)	83,10%	97,32%	87,29%	86,69%	99,64%	95,09%
	Negative Biodiversity Footprint (NBF, in Ha eq.)	0,22	1,29	0,49	21,69	0,01	1,03
	Percentage of NBF / NBF (%)	16,90%	2,68%	12,71%	13,31%	0,36%	4,91%

		Rocky Mountain Foothill Limber Pine - Juniper Woodland	Rocky Mountain Lodgepole Pine Forest	Rocky Mountain Lower Montane, Foothill, and Valley Grassland	Rocky Mountain Lower Montane-Foothill Riparian Woodland and Shrubland	Rocky Mountain Montane Douglas-fir Forest and Woodland	Rocky Mountain Montane-Foothill Deciduous Shrubland	Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland
At acquisition (different dates)	Total Biodiversity Footprint (TBF, in Ha)	10,26	191,59	699,88	14,80	480,87	56,93	17,78
	Percentage of TBF / TBF (%)	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%
	Positive Biodiversity Footprint (PBF, in Ha eq.)	10,26	189,28	589,59	14,19	467,73	53,18	17,72
	Percentage of PBF / TBF (%)	100,00%	98,79%	84,24%	95,88%	97,27%	93,40%	99,64%
	Negative Biodiversity Footprint (NBF, in Ha eq.)	0,00	2,31	110,29	0,61	13,14	3,76	0,06
	Percentage of NBF / NBF (%)	0,00%	1,21%	15,76%	4,12%	2,73%	6,60%	0,36%
Current state after management takeover (2021)	Total Biodiversity Footprint (TBF, in Ha)	10,26	191,59	699,88	14,80	480,87	56,93	17,78
	Percentage of TBF (%)	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%
	Positive Biodiversity Footprint (PBF, in Ha eq.)	9,84	108,55	373,63	13,98	443,48	52,61	17,72
	Percentage of PBF / TBF (%)	95,84%	56,66%	53,38%	94,42%	92,23%	92,41%	99,64%
	Negative Biodiversity Footprint (NBF, in Ha eq.)	0,43	83,03	326,25	0,83	37,39	4,32	0,06
	Percentage of NBF / NBF (%)	4,16%	43,34%	46,62%	5,58%	7,77%	7,59%	0,36%

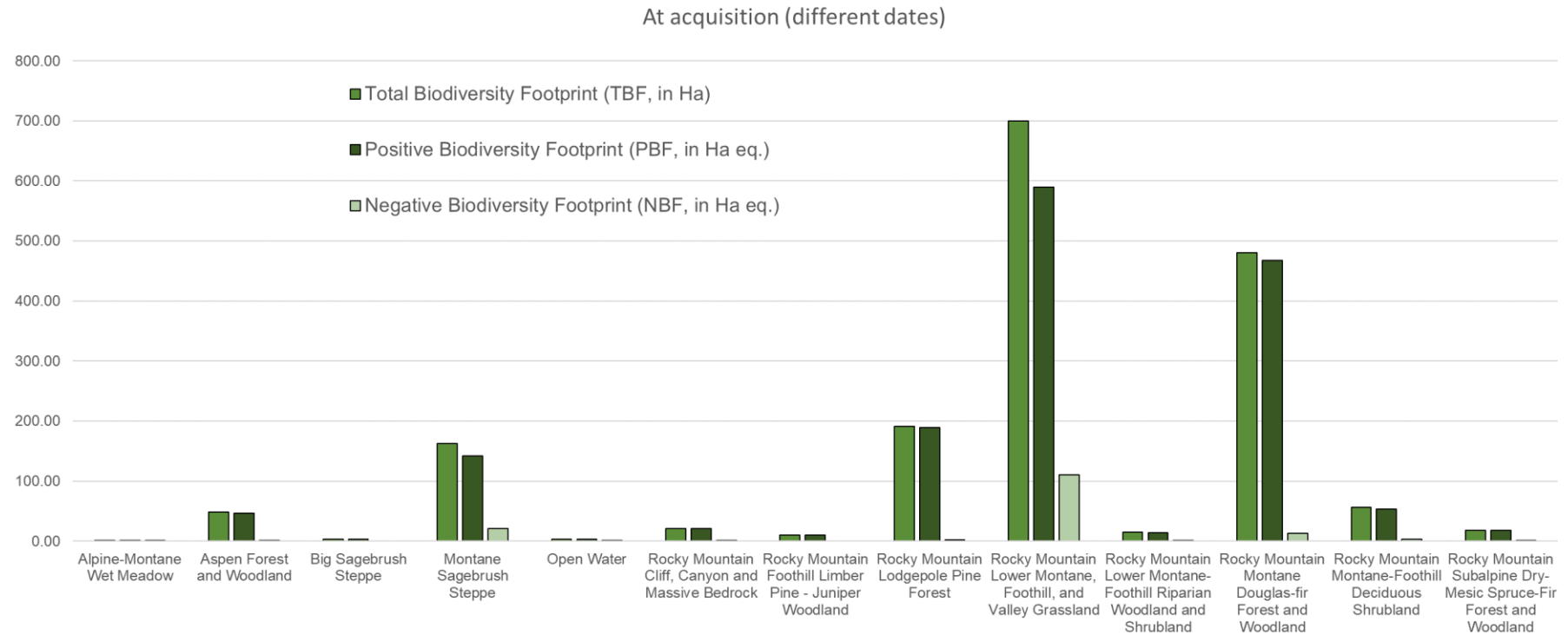


Figure 7: The Total Biodiversity Footprint (TBF), Positive Biodiversity Footprint (PBF) and Negative Biodiversity Footprint (NBF) of USA operations at acquisition, broken down per ecosystem asset

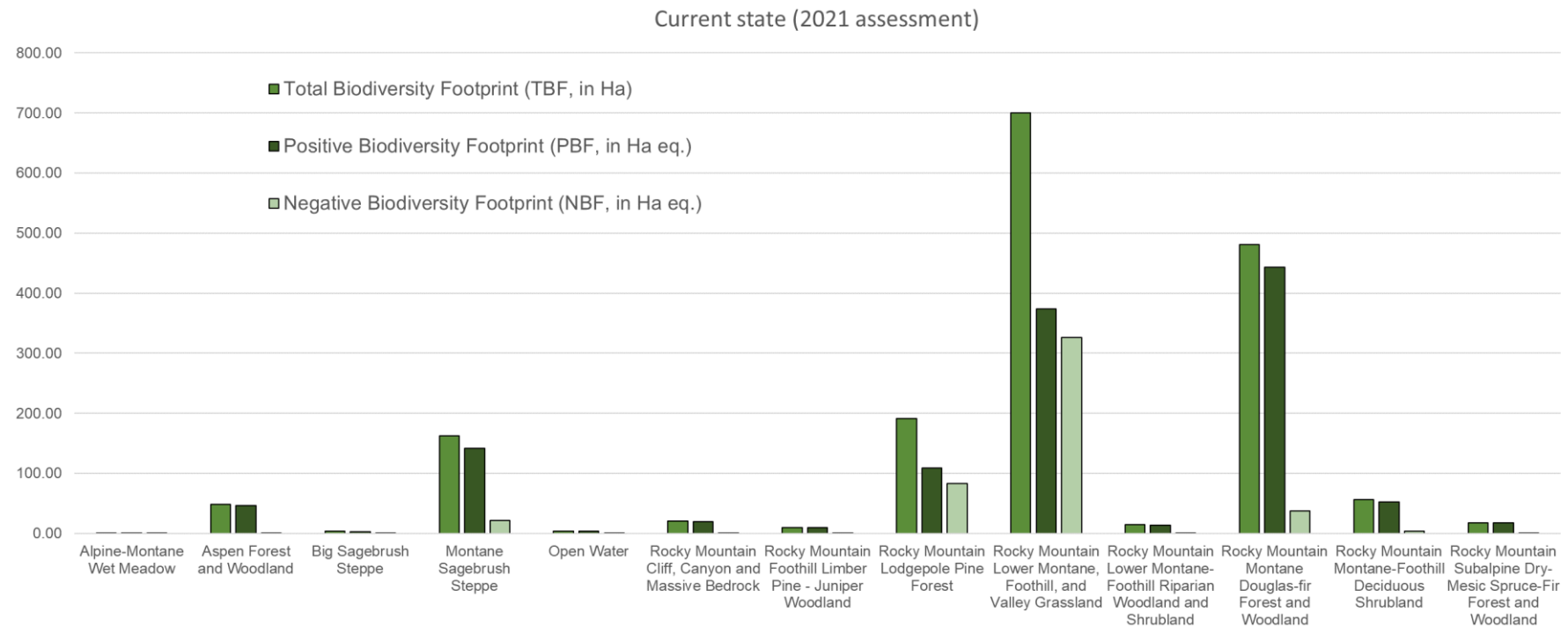


Figure 8: The Total Biodiversity Footprint (TBF), Positive Biodiversity Footprint (PBF) and Negative Biodiversity Footprint (NBF) of USA operations at time of assessment, broken down per ecosystem asset

6. Discussions and recommendations going forward

This section focuses on compiling group-level recommendations for Sibanye-Stillwater. These recommendations are organized around three broad topics: (a) completing and improving the biodiversity asset registry, (b) disclosure requirements and opportunities and (c) target setting.

6.1 Completing and improving the biodiversity asset register

While significant progress has been completed over the past year, some gaps remain towards a complete biodiversity asset registry. Here are listed the major ones.

- A. Sibanye-Stillwater needs to develop ecosystem-specific condition monitoring protocols to be able to monitor cost-effectively any changes in their state. This should include specifying re-assessment periodicity, triggers for (re)assessment, criteria, and thresholds for determining changes from one condition score to another. This is critical for site management, target setting, budgeting, progress monitoring, performance assessment and disclosure. This gap applies to both SA and USA operations.
- B. In addition, USA operations would need to:
 - Expand the assessments to include conservation easements and claims;
 - Consider assessing the population sizes of two material species (i.e. grizzly bear and Canada lynx) in USA operations. Because these are highly mobile, low-density species, viable populations are only possible at the landscape level, beyond Sibanye-Stillwater operations; which implies to assess the share of the population over which Sibanye-Stillwater has control (if any).
- C. Finally, SA operations would need to:
 - Undertake a species materiality analysis,
 - Assess the current and target population or habitat size of material species,
 - Develop cost-effective monitoring programs for these material species.

In the end, the goal is to achieve inter-operability between corporate policies, targets, KPIs and site-level legal requirements, monitoring systems and management plans. It is critical to ensure the management plans integrated with other business and legal processes to ensure alignment and implementation.

6.2 Disclosure requirements and opportunities

The BD Protocol recommends that a quality biodiversity disclosure includes:

- Narratives about your company’s approach to managing biodiversity, notably:
 - Its biodiversity policies, strategies, action plans, targets and key performance indicators, notably with regards to implementing the mitigation hierarchy (avoidance, minimisation, restoration / rehabilitation, offsetting and/ or voluntary conservation measures) of each component of its biodiversity impact inventory (i.e. each ecosystem and material species).
 - Its actual and planned contributions to international and national biodiversity targets (e.g. CBD’s post-2020 Global Biodiversity Framework, SDG 15 “Life on Land” and SDG 14 “Life under Water”); for instance, its contributions (including cost savings) to society realised through either the management or control of biodiversity assets or, ideally, through long-term positive biodiversity gains (i.e. the establishing and managing of a private protected area, formally declared under the applicable legislation)).
- Quantitative, non-monetary information about the scale of your biodiversity positive and negative impacts, as per the Biodiversity Accounting Framework of the BD Protocol, which implies producing Statements of Position and Performance segregated as follows:
 - Per accounting period;
 - Per selected value chain boundary (i.e. direct operations, upstream and/or downstream);
 - Per type of impact (i.e. direct, indirect and/or future);
 - Per biodiversity feature (i.e. aggregable ecosystem accounts and distinct accounts for each material taxon).

- Financial information on its expenses and liabilities associated with the implementation of the mitigation hierarchy, notably no-net-loss/ net-gain legal requirements (e.g. capital and operation expenditures of offset requirements); which may be expressed in any relevant currency as per International Financial Reporting Standards and generally accepted accounting practices, and broken down per biodiversity asset category (e.g. ZAR or US \$ / ha of ecosystem type or taxon);

At this stage, given the progress to date, and noting that this is an iterative process that aims at continual improvement, Sibanye-Stillwater should disclose its:

- Draft ecosystem impact inventory / asset register, including total surface area and residual condition-adjusted surface area, broken down per mining operation and ecosystem asset type,
- Key methodology aspects, as per the BD Protocol, notably the selected organisational and value chain boundaries, the selected impact category (i.e. direct impacts), the reliance on site-based state data, the use of different condition rating methods for different ecosystem types and the reliance on double-entry bookkeeping to record changes in the state of biodiversity assets (see section 3);
- Draft Total, Positive & Negative Biodiversity Footprints overall for SA and USA operations, as well as overall for the group.
- Progress towards full adhere to the BD Protocol accounting and reporting principles (self-assessment via an internal review process):
 - **Relevance:** Full adherence. All direct impacts of operations assessed.
 - **Equivalency:** Full adherence. Identification of all ecosystem types at national / state level and gains / losses recorded separately for each asset category; through further work (site surveys) may lead to further refinements.
 - **Completeness:** Partial adherence. All direct impacts on ecosystems have been included (land use and water emissions); though further site-surveys regarding the direct impacts of water emissions are required for several sites. The material species register needs to be completed (SA operations) and refined (USA operations).

- **Consistency:** Full adherence. Consistent methods per similar biodiversity asset have been used throughout operations.
- **Transparency:** Full adherence. All assumptions and limitations have been documented.
- **Accuracy:** Varying levels of accuracy for the ecosystem impact inventory (depends on the ecosystem type and operation).

NB: No SMART target should be disclosed yet (see section 5.3).

6.3 Target setting

As per the BD Protocol, target setting within a biodiversity accounting context must apply to each component of the asset register / inventory, separately. It may be influenced or dictated by policies, specific procurement rules, standards and / or jurisdictional laws or regulations, for instance no-net-loss requirements for specific biodiversity assets (e.g., protected species, wetlands). Furthermore, targets can be framed from two perspectives:

- A periodic impact perspective, whereby targets are based on expected or desired positive (net positive / net gain), neutral (no net loss) or negative (net loss) changes in the state of biodiversity assets over a given period (e.g., one or several years),
- From an accumulated impact perspective, whereby targets are based as the expected or desired share of the Total Biodiversity Footprint, per biodiversity asset category, which is positive (Positive Biodiversity Footprint) or negative (Negative Biodiversity Footprint).

As part of this assessment, all operations have explored scenarios of changes in the context of Sibanye-Stillwater's biodiversity policy (i.e. *achieving a "no net loss" for new/greenfield operations and a "net gain" in biodiversity for existing operations; see section 3.4*). The details of each scenario and associated expected changes in the Total, Positive and Negative Biodiversity Footprints of each operation / ecosystem asset can be found in the individual mine report listed in section 3.2.

In summary, minimum PBF requirements have been set per ecosystem type and

mine. These typically correspond to the residual state (extent adjusted for condition) at the time of acquisition. In some cases, further losses have occurred since acquisition, which implies investing in restoration measures.

However, given the gaps identified in section 5.1, it is premature to finalize and disclose any target(s). As explained, two key activities are required going forward:

- Completing and refining the material species impact inventory / asset register;
- Developing ecosystem-specific condition monitoring protocols.

Furthermore, the need to better understand local spatial heterogeneity and recovery potential of various ecosystems at different sites, coupled to an analysis of landscape-level conservation opportunities (i.e. beyond the legal boundaries of Sibanye-Stillwater's operations), is preventing the development of SMART target articulated around the mitigation hierarchy.

7. Contact Details:

Dr Joël Houdet, BD Protocol Lead

joelh-consultant@ewt.org.za

Dr Gabi Teren, Programme Manager, NBBN

GabiT@ewt.org.za

URL: <https://www.nbbnbdp.org/bd-protocol.html>
www.ewt.org.za/NBBN

Preferred citation: Houdet, J., Teren, G., 2022. Sibanye-Stillwater's consolidated biodiversity footprint. Pilot assessment as per the Biological Diversity Protocol – Group level consolidated report. National Biodiversity & Business Network – Endangered Wildlife Trust / Sibanye-Stillwater

Annexes

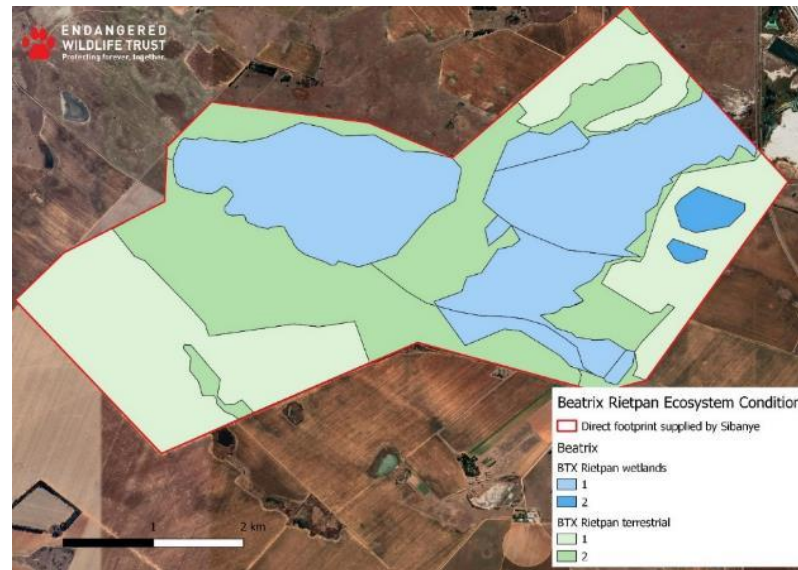
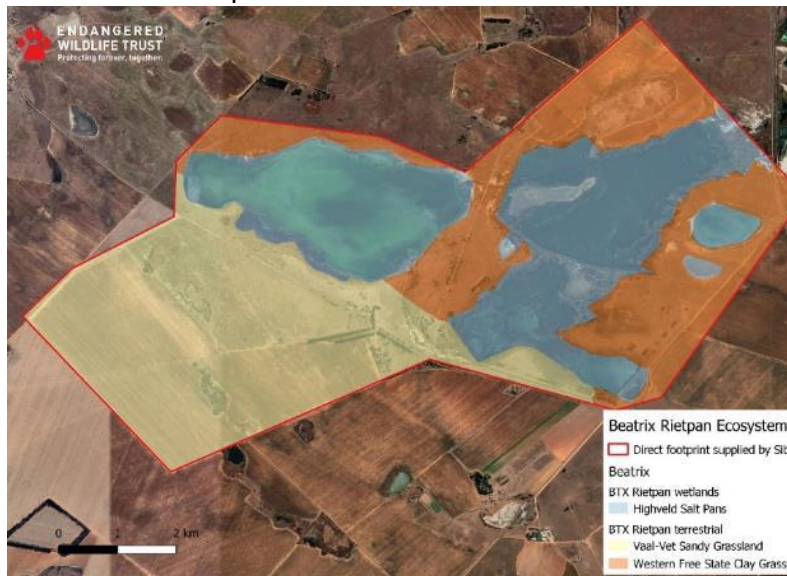
The annexes present the ecosystem extent and condition maps of ecosystem assets for SA operations. Only ecosystem extent maps are available for USA operations at this stage.

Ecosystem Assets

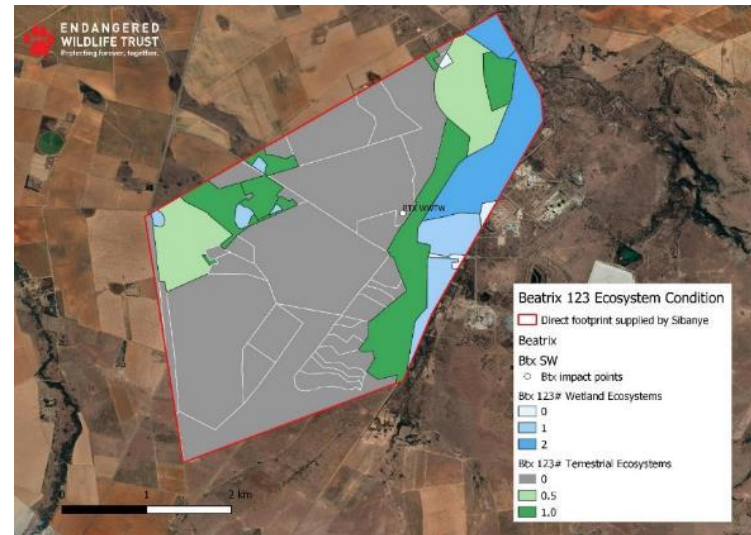
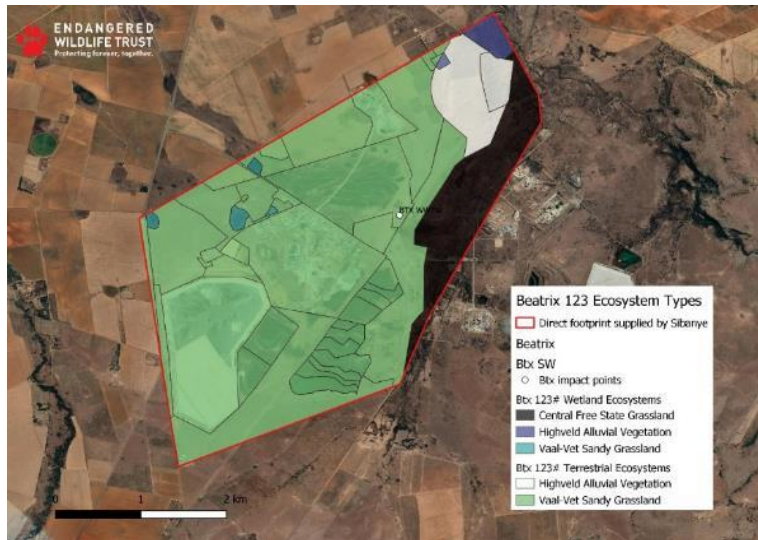
Condition of Ecosystem Assets

1. South African Operations

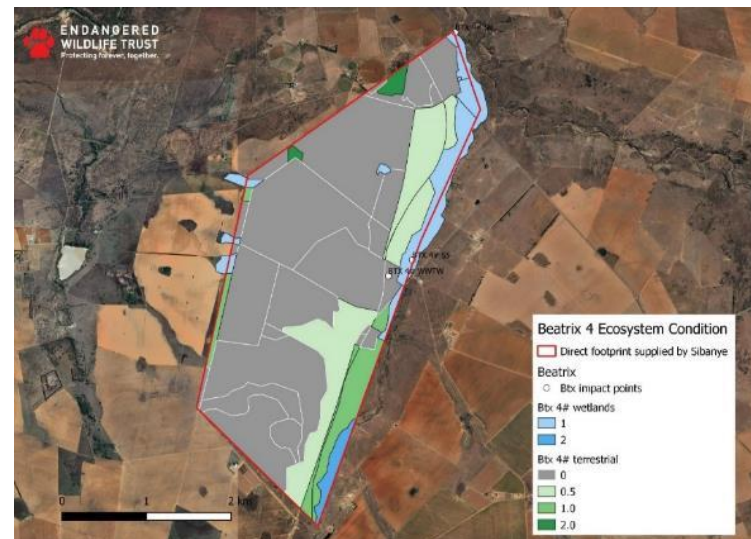
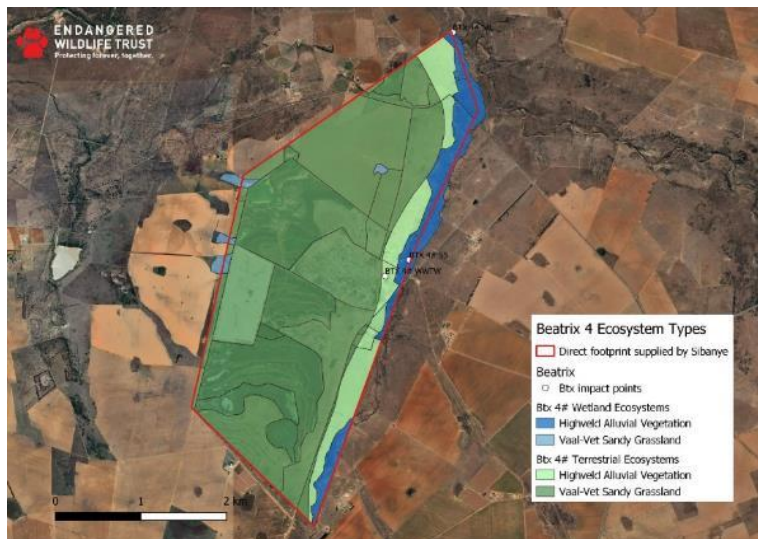
1.1.1 Beatrix Rietpan



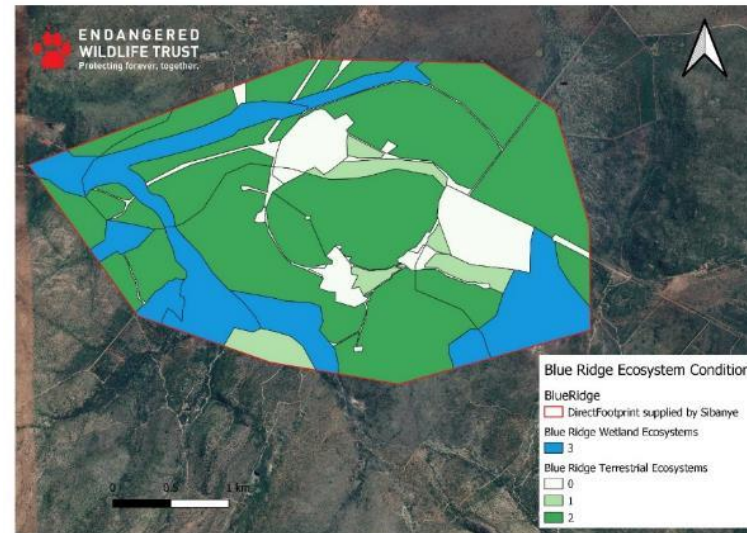
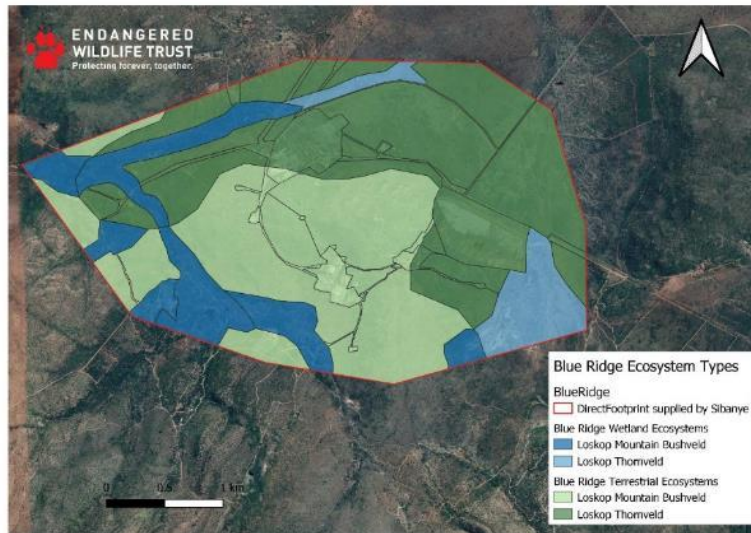
1.1.2 Beatrix 123



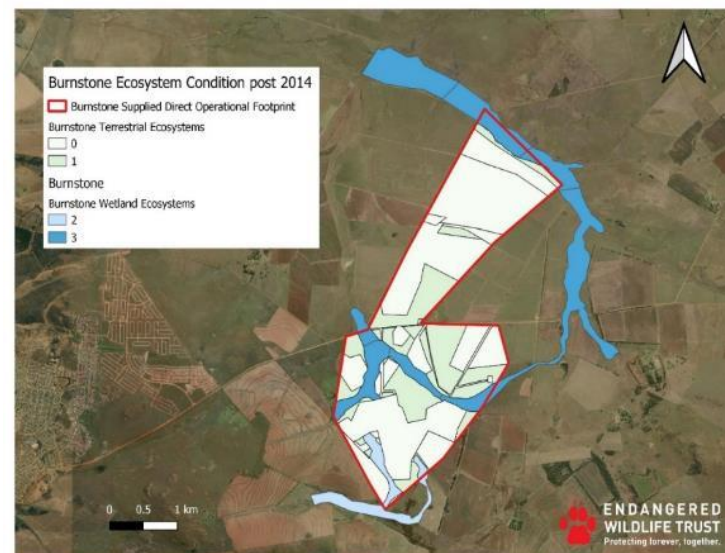
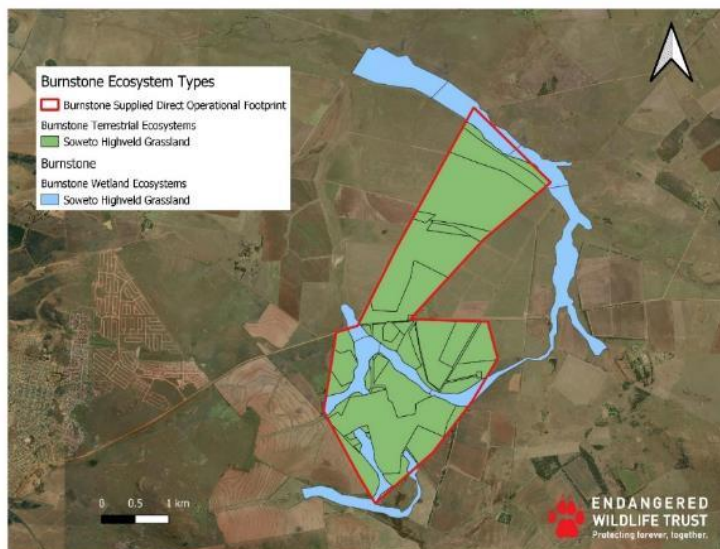
1.1.3 Beatrix 4#



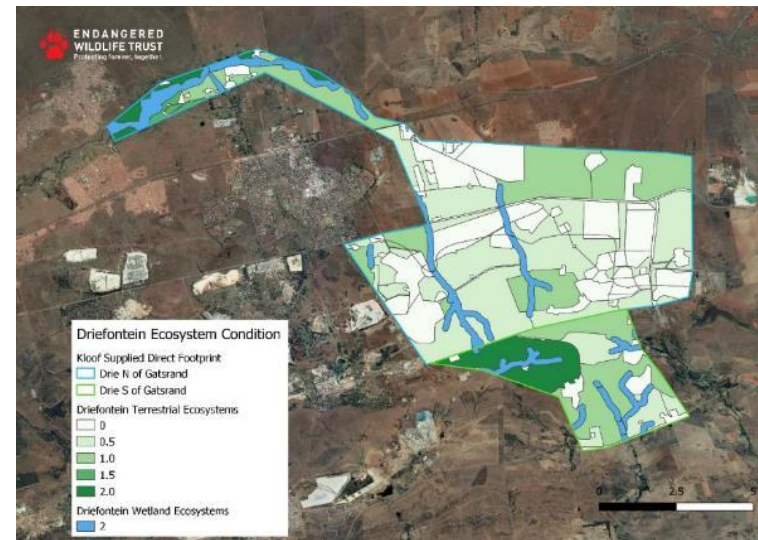
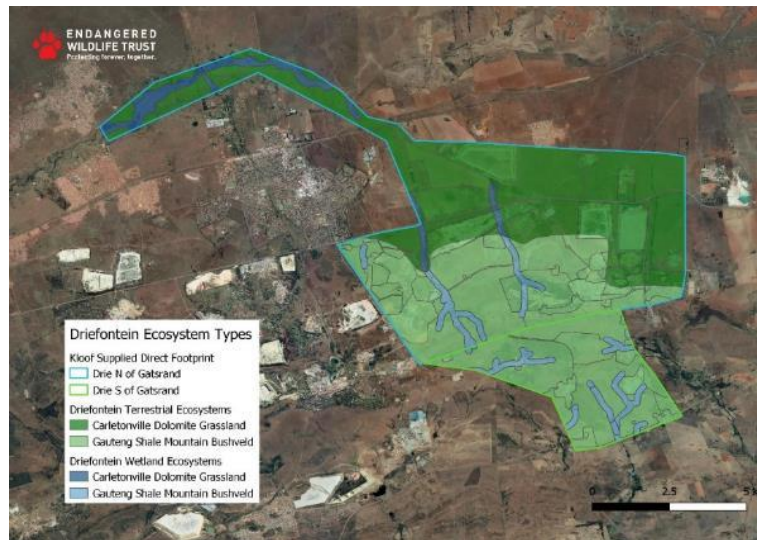
1.2. Blue Ridge



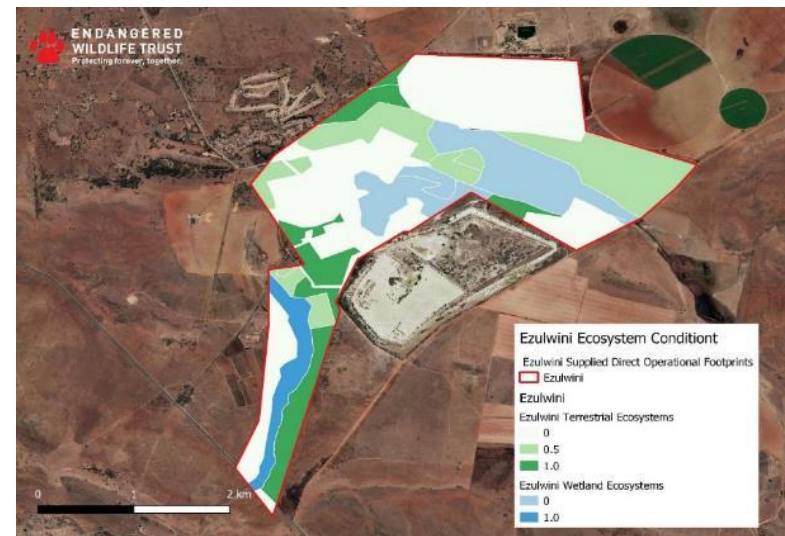
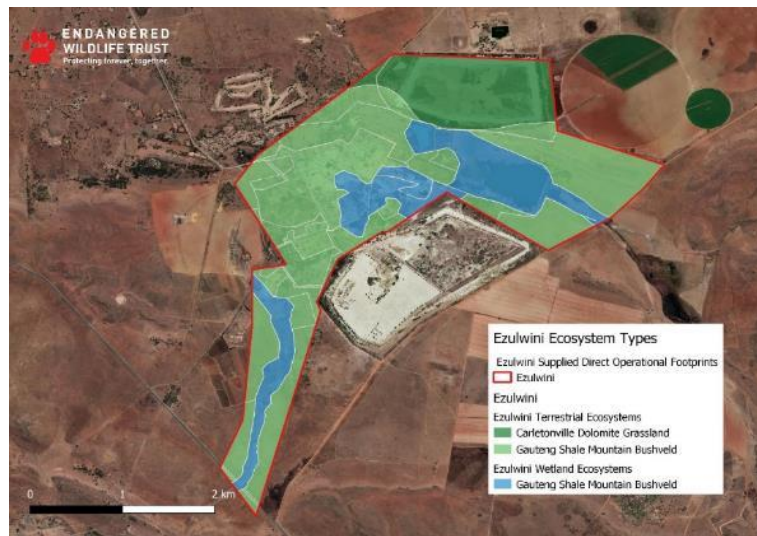
1.3. Burnstone



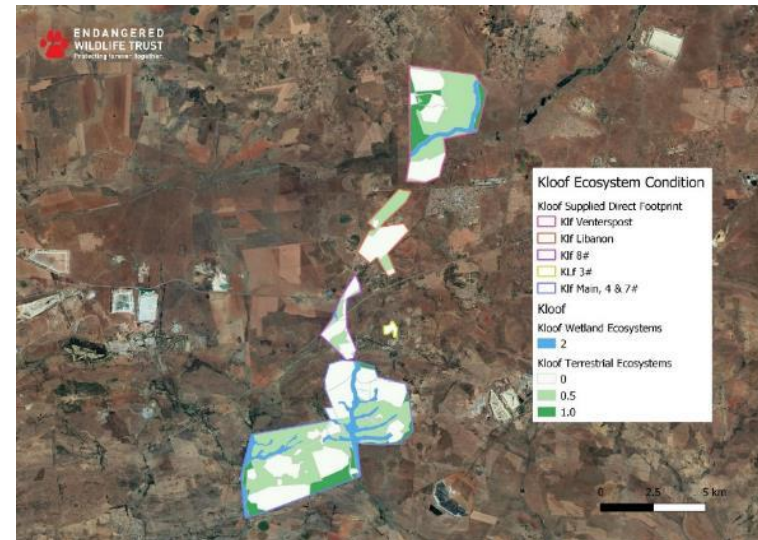
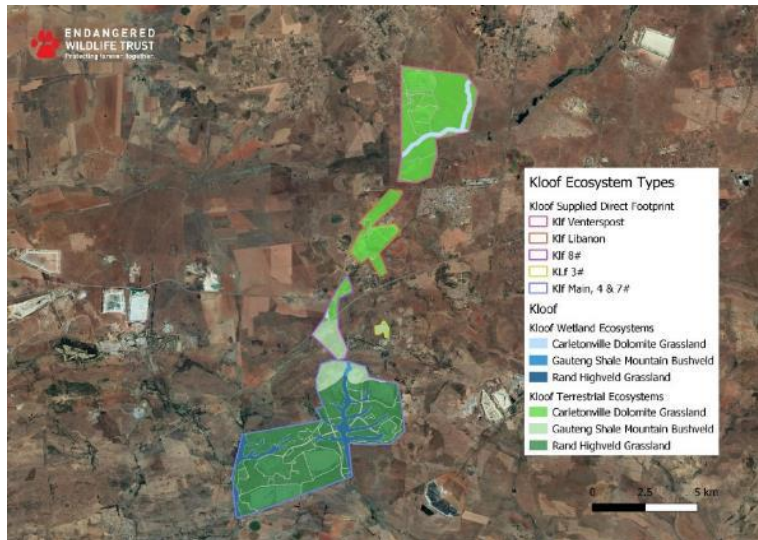
1.4. Driefontein



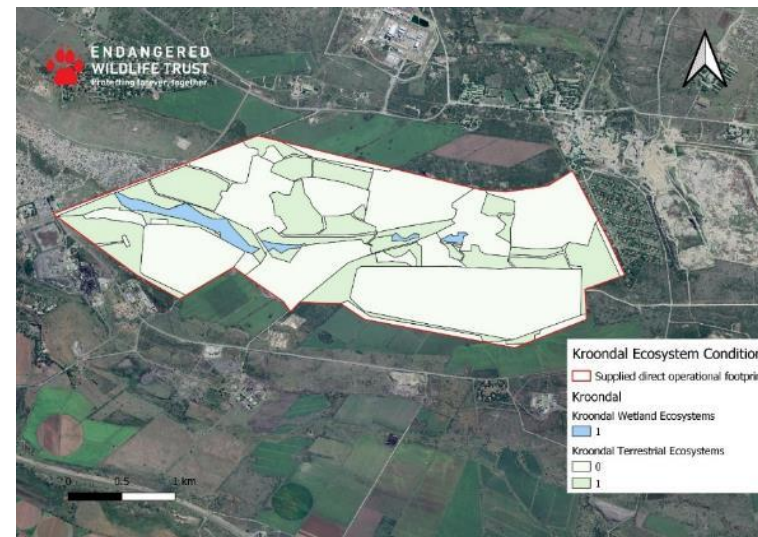
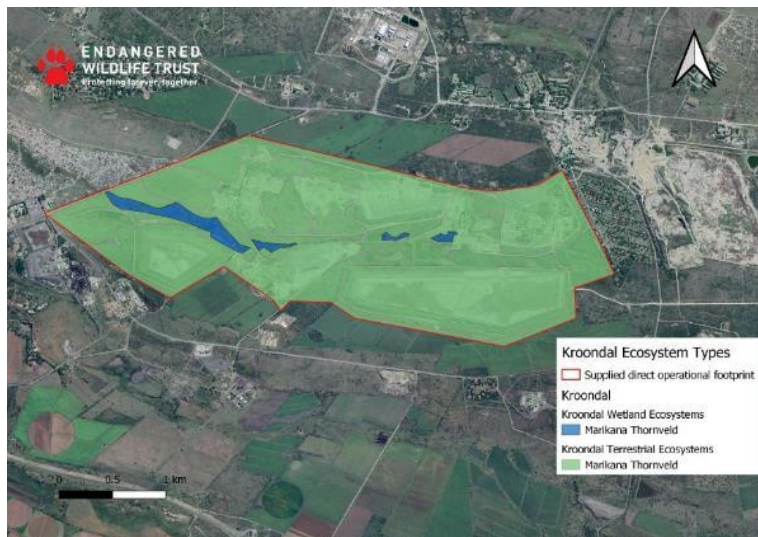
1.5. Ezulwini



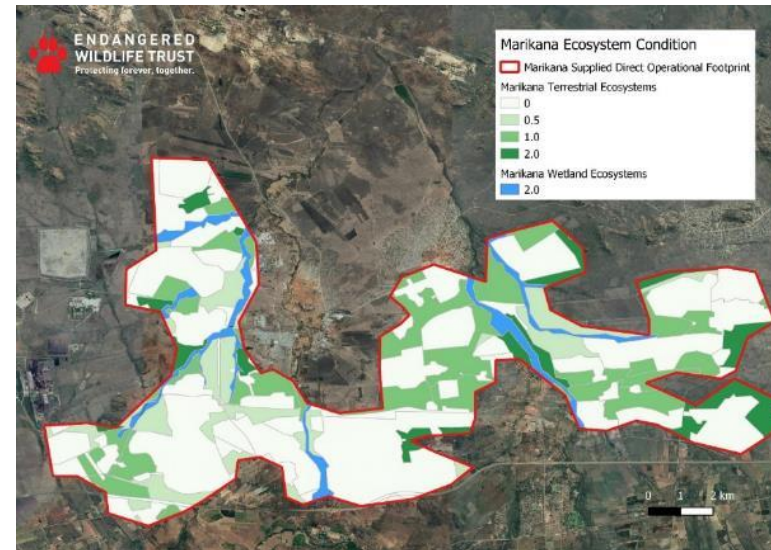
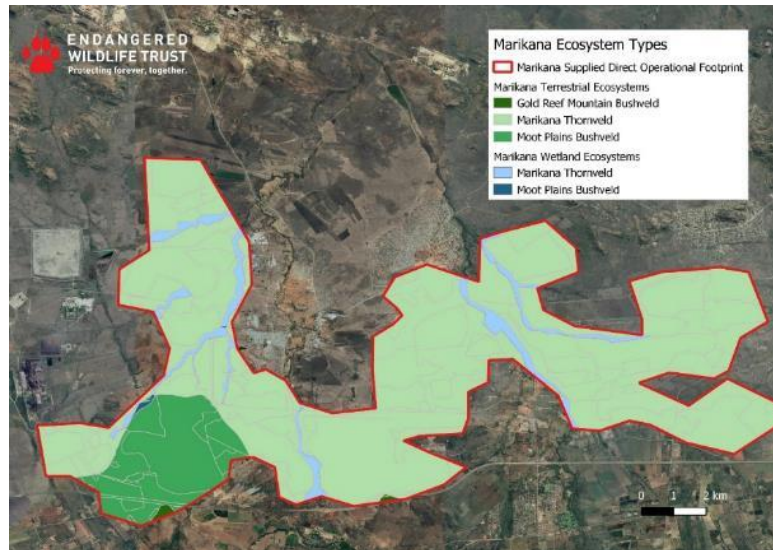
1.6. Kloof



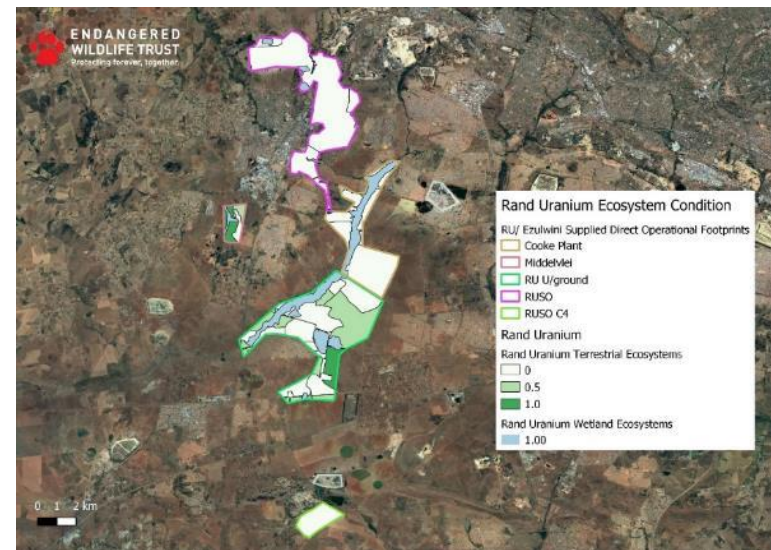
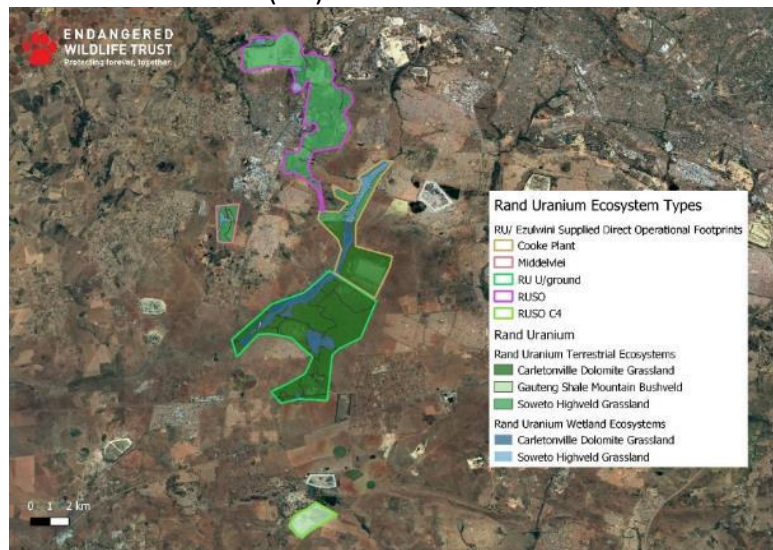
1.7. Kroondal



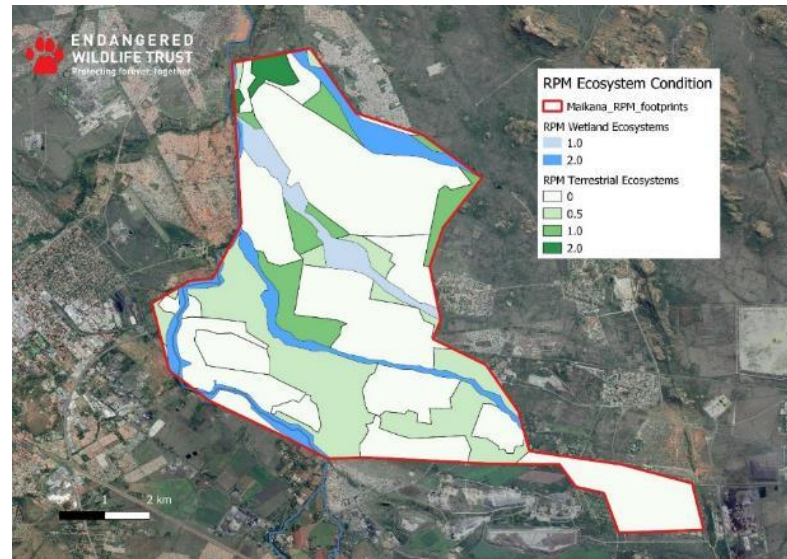
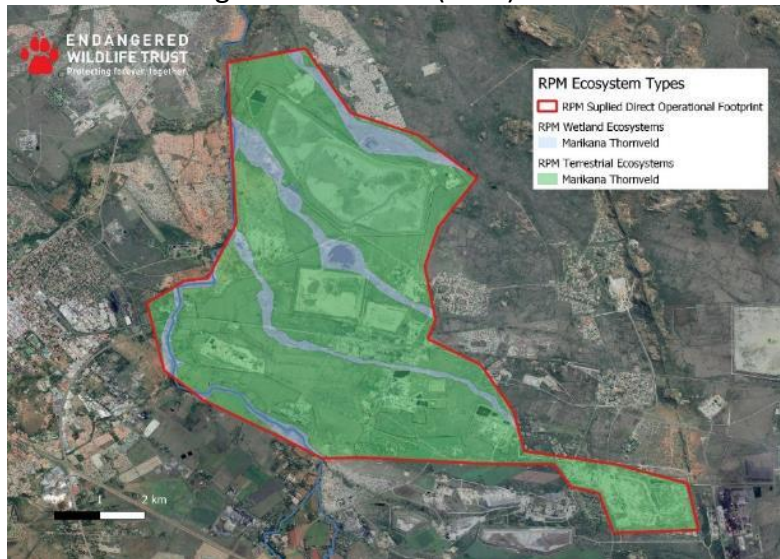
1.8. Marikana



1.9. Rand Uranium (RU)

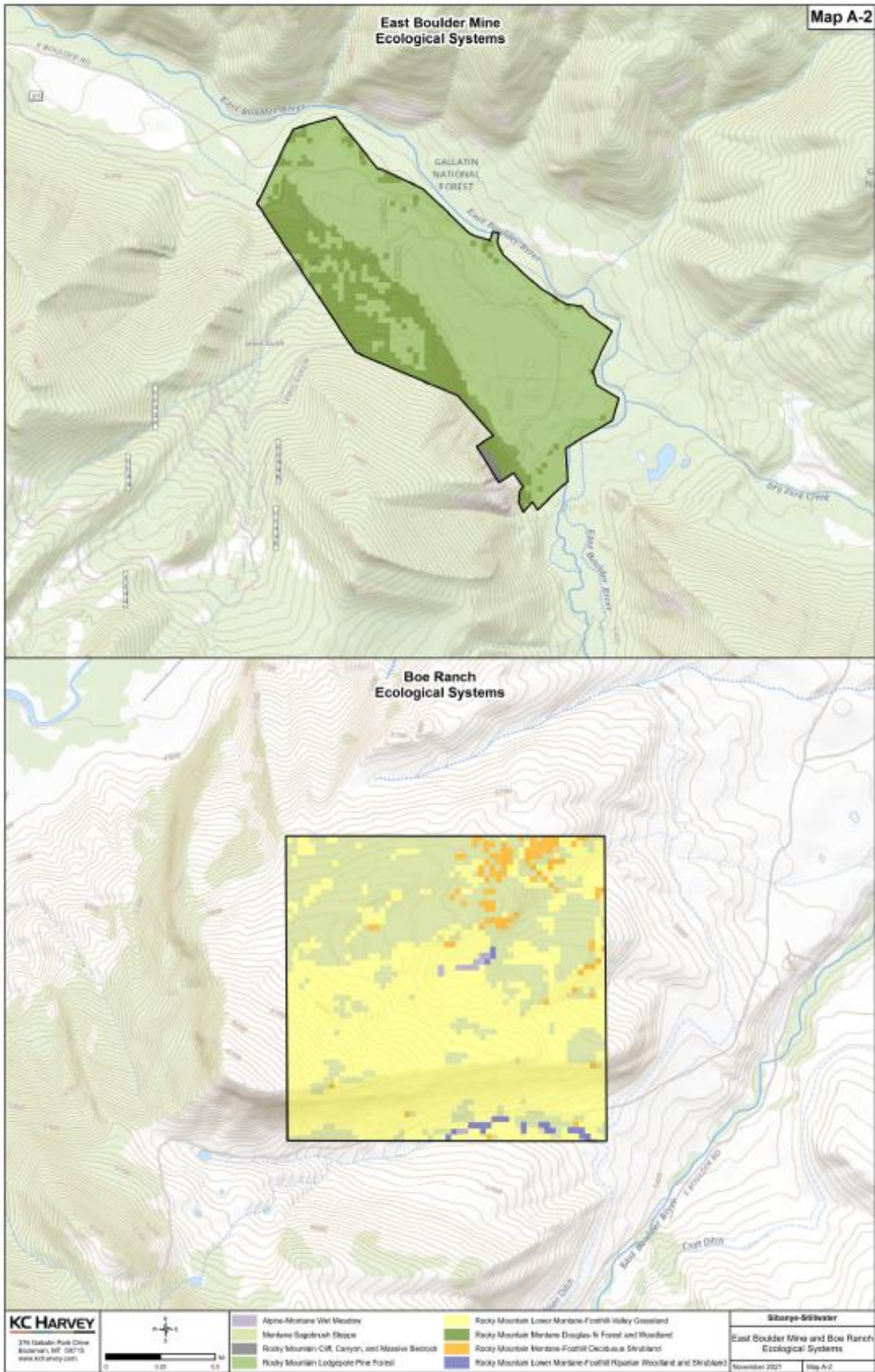


1.10. Rustenburg Platinum Mine (RPM)

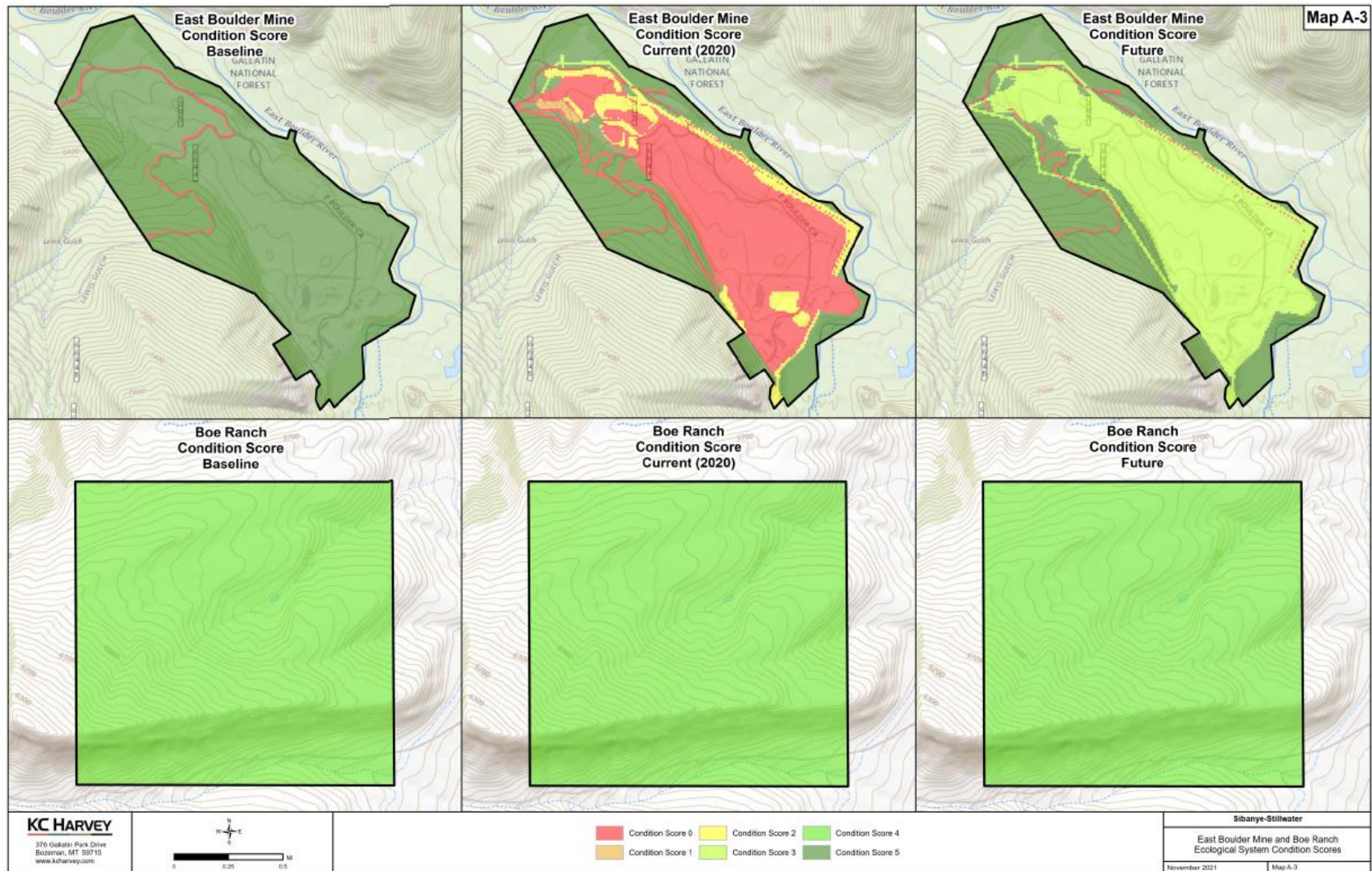


2. USA Operations

2.1.1 East Boulder Mine Ecosystem Assets



2.1.2 East Boulder Mine Condition of Ecosystem Assets



2.2 Stillwater Mine

