

Current and projected mining impacts on grasslands, wetlands and watersheds

SELECT COMMITTEE ON LAND AND MINERAL RESOURCES
25 November 2014



Biodiversity and Conservation



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Mining & biodiversity: Introduction

- The mining and biodiversity sectors have very differing goals and mandates, making the integration of biodiversity into the mining sector particularly challenging
- Open cast mining has a substantial impact on biodiversity at mine sites, effectively removing both structural and compositional biodiversity.
- Often sited within drainage areas, which provide close access to coal seams - therefore have a disproportionate impact on wetlands
- Off-site impacts, resulting from abstraction and acidification of water, -
 - occur in a broader area outside of mine sites.
 - impacts can change hydrological functioning of important wetlands that occur within grasslands.



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Grasslands Biome

- Covers nearly 30% of the country's land surface area.
- A rich store of biodiversity assets
- A region of global significance
- An important water production landscape - 5 of South Africa's major river systems that have their headwaters in the biome. Nearly half of the country's Strategic Water Source Areas are in the Grassland Biome.
- Home to South Africa's economic heartland: 60% of South Africa's commercial crops and 50% of subsistence croplands; 44% of the country's cattle and 32% of its sheep; more than 40 % of all mining activities and 92 % of commercial plantation forestry
- 40% of the biome has already been irreversibly modified, 60% of remaining

grassland is threatened and less than 3% of it is under formal protection.



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Coal Mining in Grasslands

- Gold, diamonds, uranium and other minerals are mined within the Grasslands Biome, however coal mining is the most significant type of mining that occurs in these areas.
- Recent large increase in prospecting and mining rights applications throughout the Grasslands Biome especially in wetlands and upper catchments
- Through the GEF - Grassland Programme – productive engagements, particularly by providing strong scientific and technical support, through involvement with the South African Mining and Biodiversity Forum

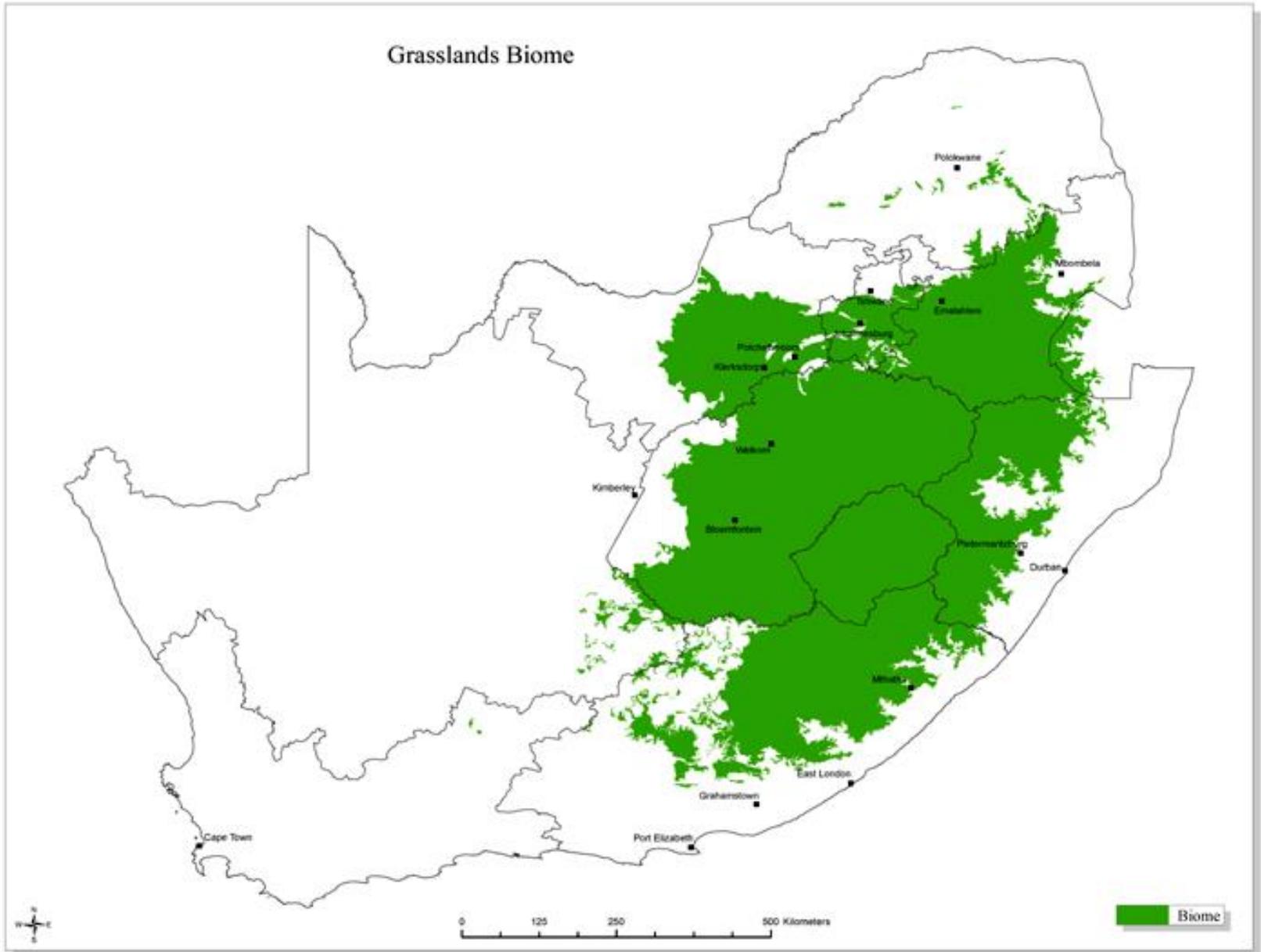


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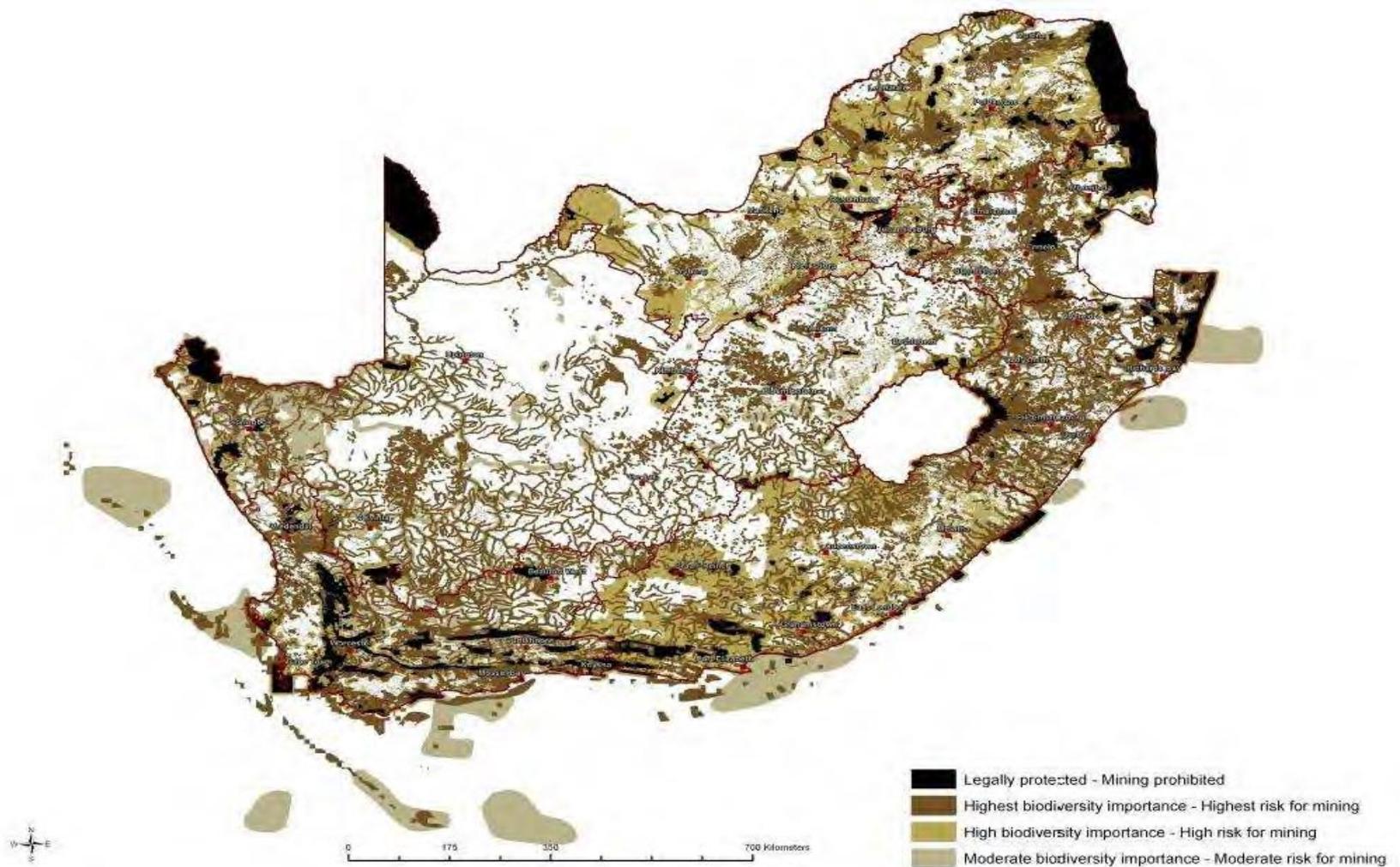
Grasslands Biome



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Figure 2: Biodiversity priority areas sensitive to the impacts of mining categorized into four categories



Mining in Wetlands

- Publication of the Mining and Biodiversity Guidelines endorsed by the Ministers of the then Water & Environmental Affairs and Mineral Resources and the organised mining industry.
- Development of the Wetland Offset Guidelines, another key resource for the mining sector to consider biodiversity.
- Mining sector now has more resources and better co-operation with the biodiversity sector to ensure that future projects will be able to consider biodiversity more appropriately



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Summary Impacts of Mining on Water Systems

Table 14: Summary table of potential impacts (low, medium, high) on water resources

- Low impact
- Medium impact
- High impact

Source: based on SANBI Mining and Biodiversity Guideline draft documents (2011)⁶⁷

Potential impacts	Exploration, drilling and road construction	Construction phase	Active mining	Post-mining
Altered hydrological regimes	●	●	●	●
Altered geohydrological regimes	●	●	●	●
Increased acidity, heavy metals and salts	●	●	●	●
Increased turbidity	●	●	●	●
Risk of surrounding water contamination	●	●	●	●

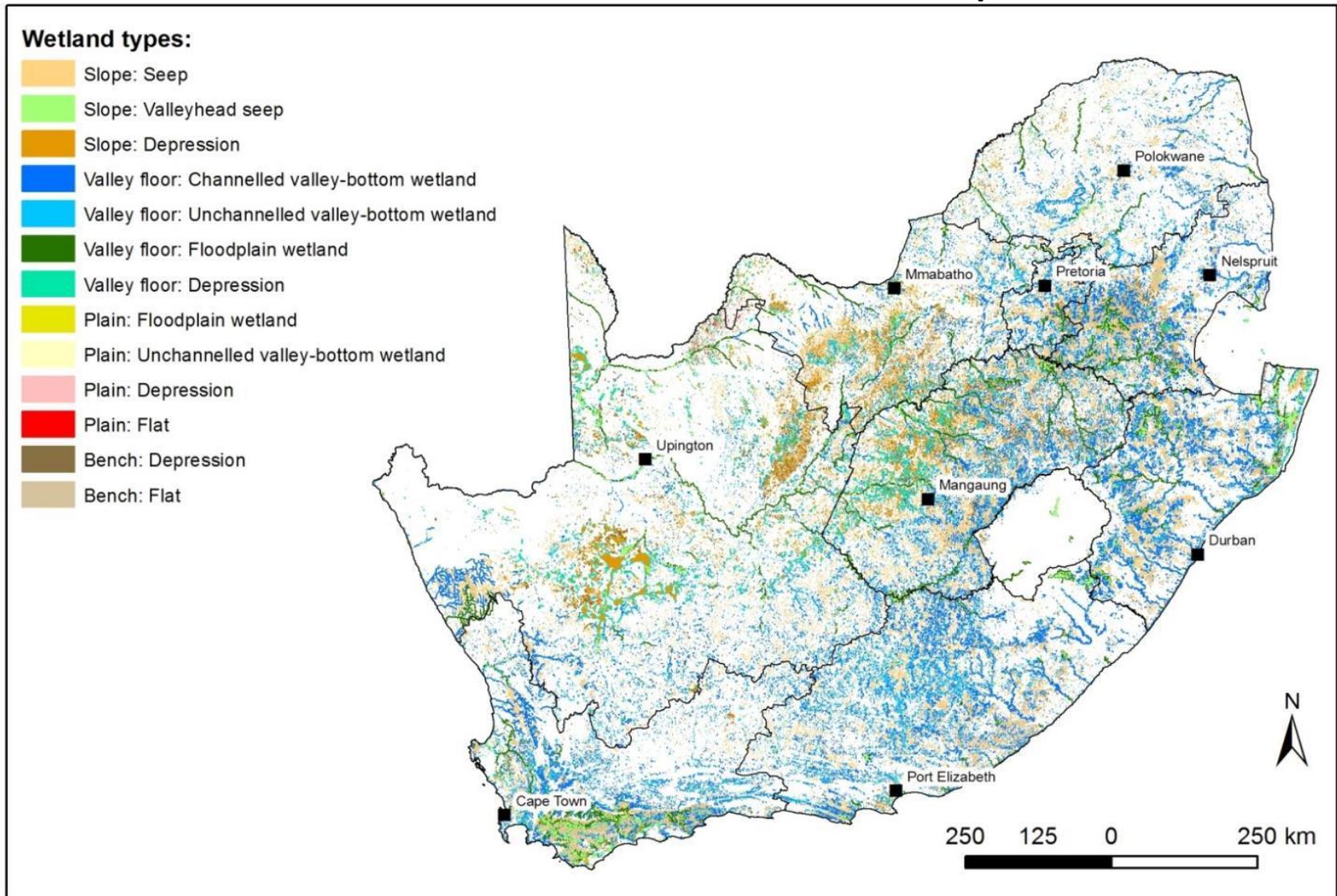


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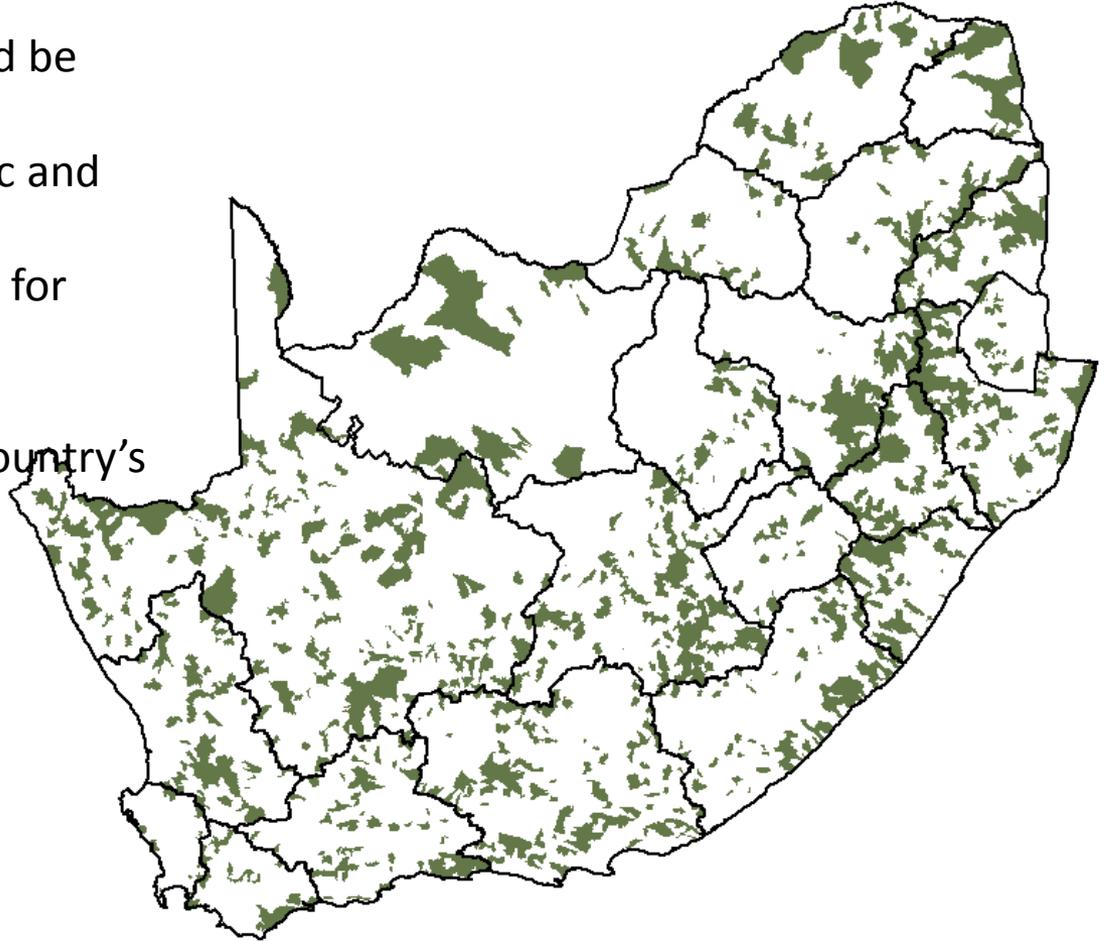
National wetland map



Freshwater Ecosystem

Priority Areas:

Those catchments that should be maintained in a healthy condition to sustain economic and social development, yet still meet national targets for conserving our freshwater biodiversity
FEPAs comprise 22% of the country's surface area



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Percentage of the area of selected key ecological infrastructure or biodiversity assets that currently has allocated mining or prospecting rights:
NATIONAL

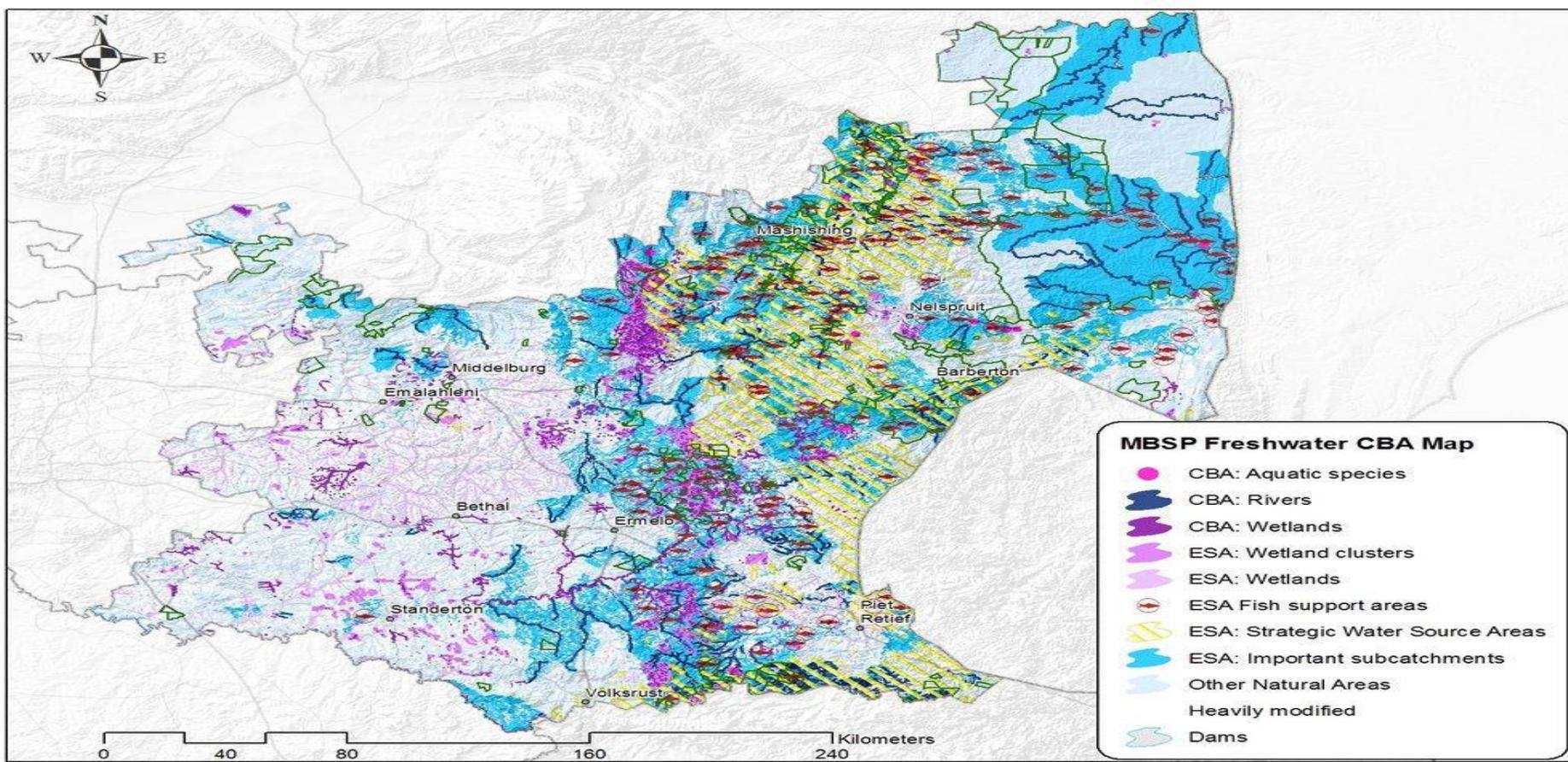
Key ecological infrastructure/biodiversity asset	Percentage area with allocated mining rights	Percentage area with allocated prospecting rights
Freshwater Ecosystem Priority Areas (FEPAs)	0,6	14,1
Strategic Water Source Areas (SWSAs)	0,2	6,6
Wetlands	1,0	9,2
Grasslands	1,2	12,5

Dataset of mining and prospecting rights supplied by DMR and updated to the end of 2013.

Percentage of the area of selected key ecological infrastructure or biodiversity assets for which mining or prospecting rights have been allocated:
MPUMALANGA

Key ecological infrastructure/biodiversity asset	Percentage area with allocated mining rights	Percentage area with allocated prospecting rights
Freshwater Ecosystem Priority Areas (FEPAs)	1,7	32,2
Strategic Water Source Areas (SWSAs)	0,3	26,4
Wetlands	0,6	25,4
Grasslands	5,2	41,8

Dataset of mining and prospecting rights supplied by DMR and updated to the end of 2013.



Mpumalanga Biodiversity Sector Plan Freshwater Assessment



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Projected Mining Impacts

- Proposed expansion of mining in Mpumalanga Province:
 - Likely to be extensive, and significant, particularly in the Grasslands Biome
 - 2000-2011: significant increase in mining applications and prospecting rights
 - Approximately 51% of surface area – applications for prospecting rights (actual farm cadastres)
 - As much as 20% of cadasters have been applied for mining rights – 70% of which, for coal (Gert Sibanda and Nkangala District municipalities)
 - Cumulative long-term mining impacts will be significant on natural environment, biodiversity and water resources



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Projected Mining impacts

- Proposed expansion of mining in Mpumalanga Province:
 - 76% of Mpumalanga's grasslands have been applied for mining rights and prospecting applications (various mining activities)
 - Proposed mining expansion – largely to occur within pristine water catchments, e.g. Usuthu Sub-WMA and Upper Komatie
 - Ecological sensitive areas within Upper Vaal Catchment (Wakkerstroom Wetlands) and Usuthu Sub-WMA (Chrissiemeer pans) – relatively pristine – mining and prospecting applications continue to be issued



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Section 48 National Environmental Management: Protected Areas Act

Despite other legislation, no person may conduct commercial prospecting or mining activities in –

- a special nature reserve, national park, marine protected area, nature reserve, world heritage site or forest protected area
- A protected environment without the written permission of the Minister of Environmental Affairs and the Minister of Mineral Resources



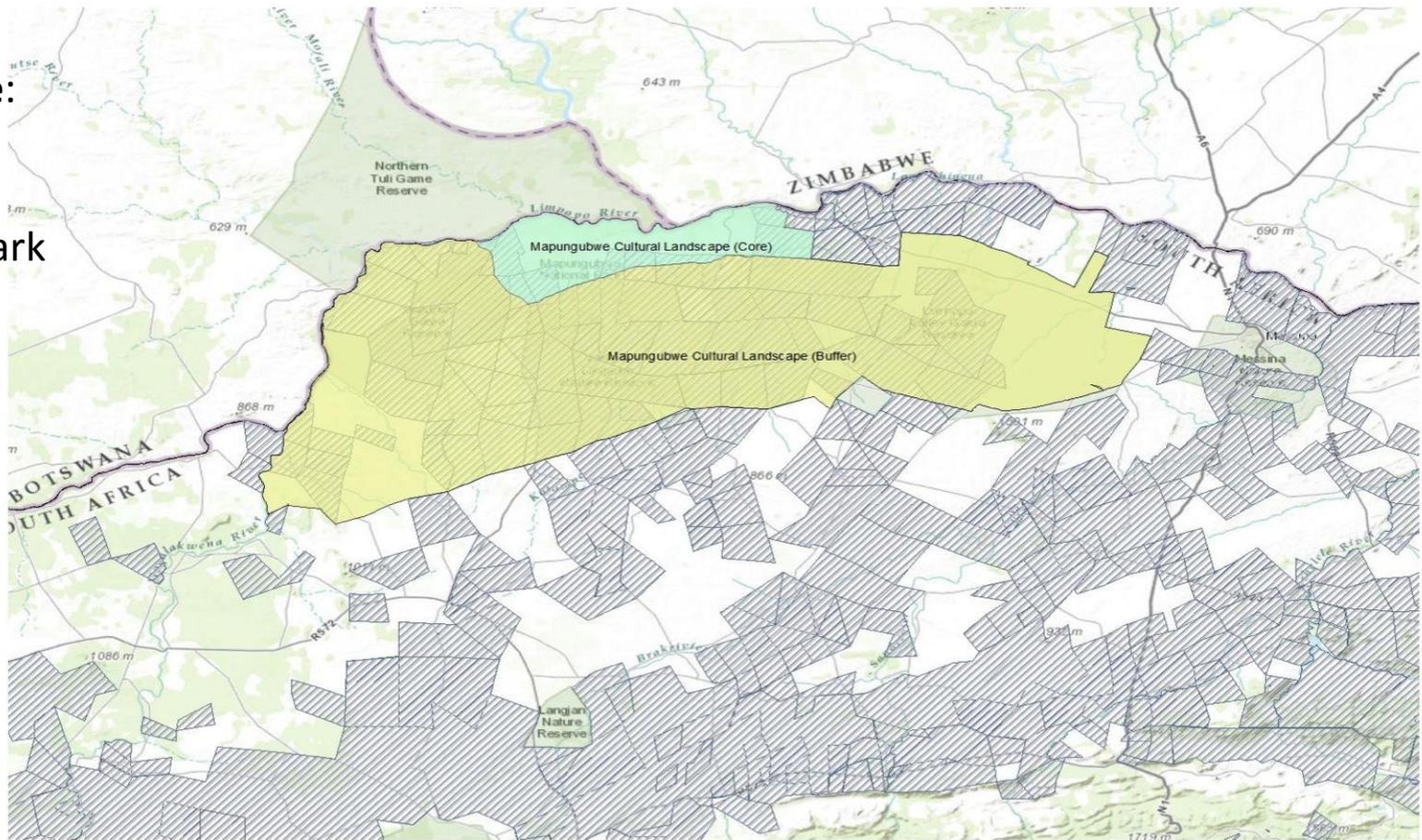
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Mapungubwe:

- WHs
- National Park
- TFCA

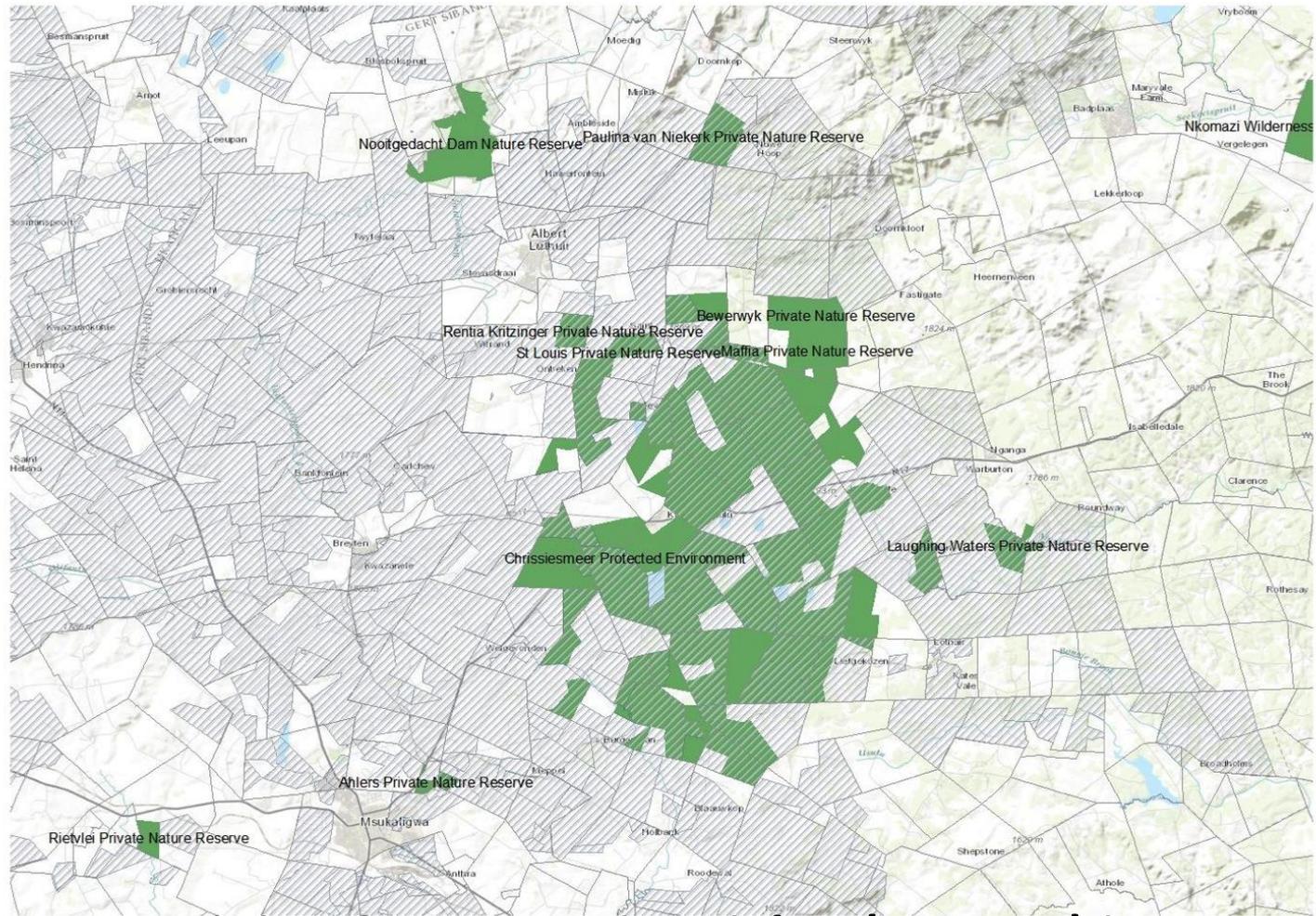


Mining & prospecting rights (MRPDA) in Mapungubwe area



Chrissiesmeer:

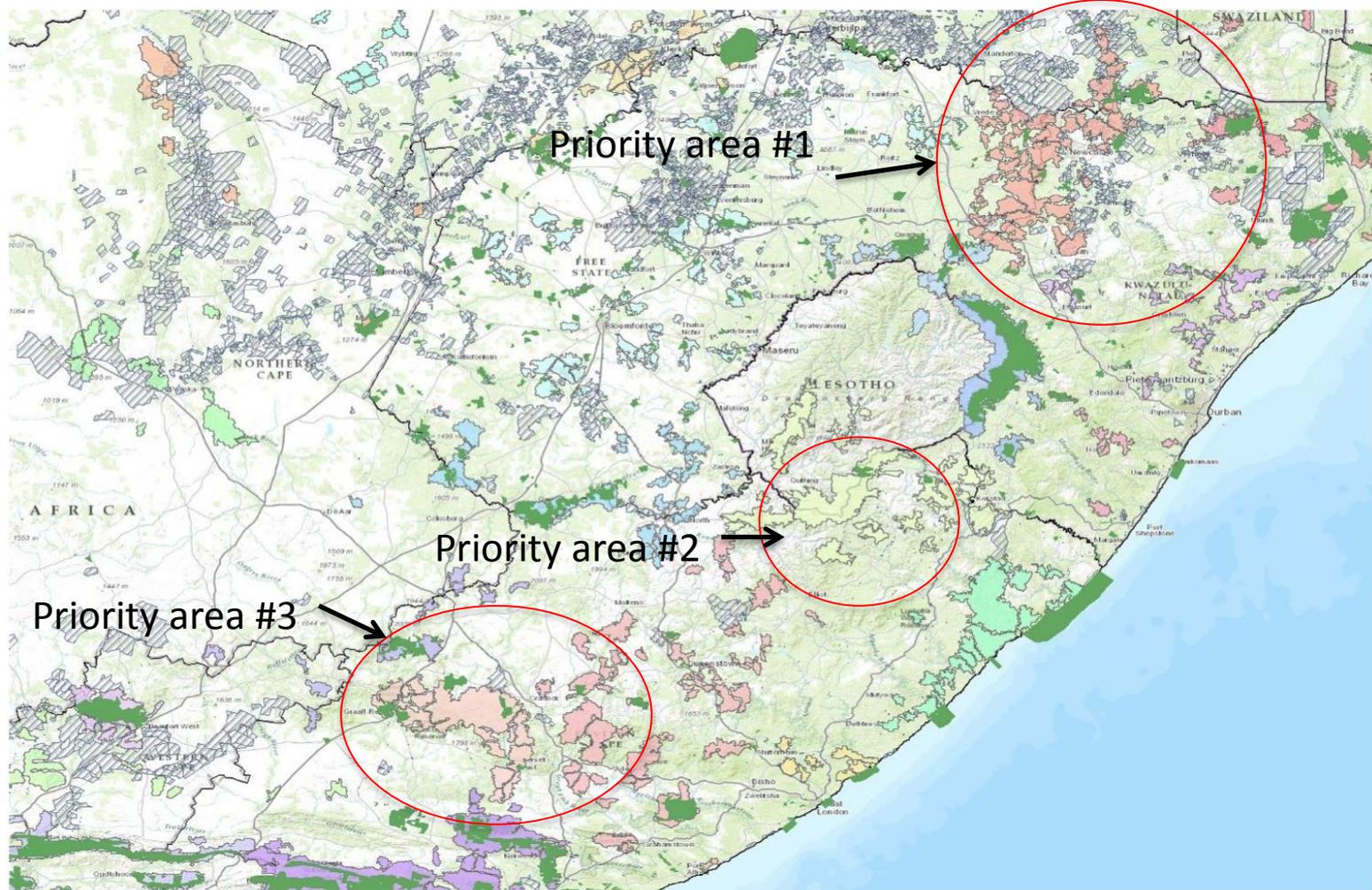
- Protected environment
- Grassland priority area
- Wetland priority area
- IBA
- Proposed Ramsar site



Mining & prospecting rights (MRPDA) in Chrissiesmeer area



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Mining & prospecting rights in priority grassland areas



- Although the overlap between mining/prospecting and the high value biodiversity/ecological infrastructure is generally low, it is more useful to zoom in to areas of extensive mining, such as the Mpumalanga Highveld, which is where the full extent of more localised trade-offs between mining and water security, biodiversity and food security become particularly apparent.
- In provinces like Mpumalanga, the extent to which prospecting overlaps with high value biodiversity/ecological infrastructure suggests that the risk posed by mining continues to increase, with corresponding risks for water, food production and biodiversity in these areas
- There thus remains an urgent need for discussions on development scenarios for these areas, in order for planning and regulatory decisions to take into account the full range of costs and benefits of mining.
- The analysis does not take into account indirect impacts of mining (e.g. acid mine drainage) on people and ecosystems

Key messages arising from analysis



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