


| | |
|---|--|
| <p style="text-align: center;">Biodiversity Management Scientific Review</p> <p style="text-align: center;"><u>Application for Environmental Authorization</u></p> |  LIMPOPO PROVINCIAL GOVERNMENT REPUBLIC OF SOUTH AFRICA DEPARTMENT OF ECONOMIC DEVELOPMENT, ENVIRONMENT & TOURISM |
|---|--|

| | |
|---|--|
| ENQ: Chuene S.I. (063 695 0626) To: Case Officer: C. Musemburi From: Director: Biodiversity Management | EIM Ref: BM Ref: Date: 26-07-2021 |
|---|--|

Subject: Review - Application for Environmental Authorization:
PROPOSED SANRAL R101 ROAD UPGRADE MODIMOLLE OF WATERBERG DISTRICT, LIMPOPO PROVINCE

1. PURPOSE

- To scientifically review and provide comments on the following application for environmental authorization:

PROPOSED SANRAL R101 ROAD UPGRADE MODIMOLLE OF WATERBERG DISTRICT, LIMPOPO PROVINCE

2. ATTACHMENTS

- The application from **The Biodiversity Company**
- is supported by the following documentation:
 - a. Draft Basic Assessment Report
 - b. Terrestrial Biodiversity Assessment Report
 - c. Freshwater Assessment Report

3. BACKGROUND

- The application centres on the following primary activities:
 - Clearing of virgin vegetation
 - Development/upgrading of liner infrastructures (road)
 - Fencing the property

4. EVALUATION AND FINDINGS

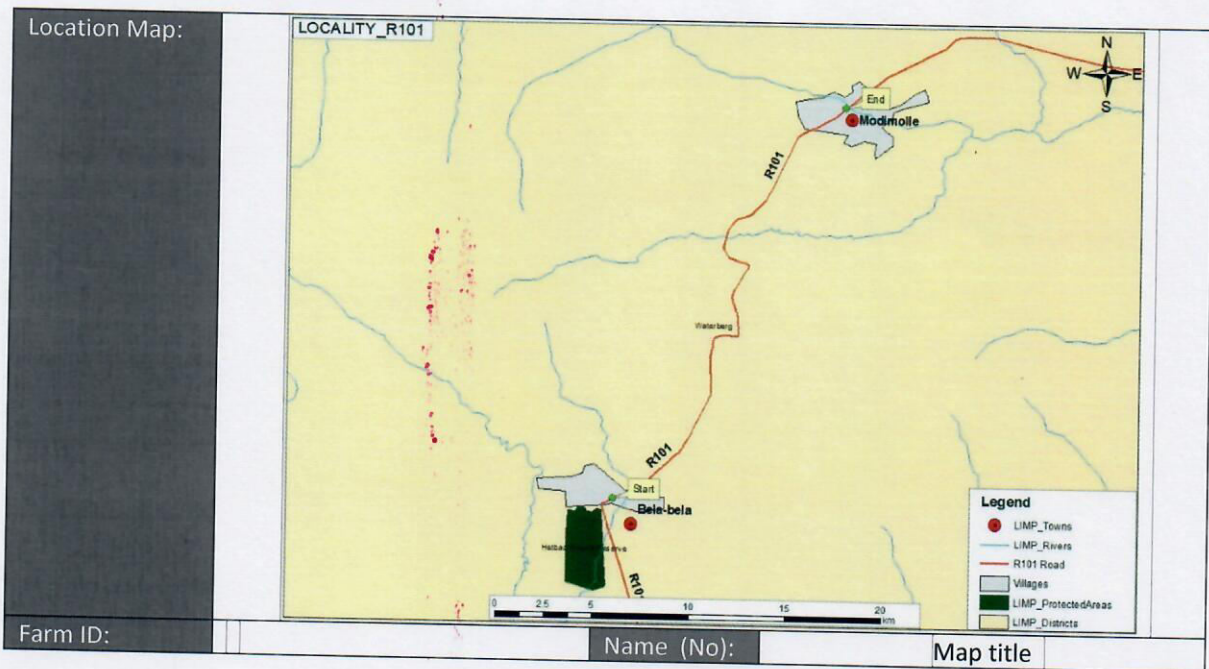
4.1. Pertinent Information drawn from the Application

| | Details | Implications |
|---|--|---|
| 1 | Sections of the R101 Road to be upgraded versus the study area | The two sections (as depicted in the Terrestrial Biodiversity Report [page 3, Figure 1-2]) of the R101 Road to be upgraded are approximately 2.5 km's long. The segments of the R101 Road to be upgraded in the Basic Assessment Report (Page 16, Figure 4) are not correlating to the Biodiversity Report sampling points and as such a realignment is required. |

| | | |
|---|--|--|
| 2 | Important Conservation Features/habitats | <p>Aquatic Habitats – all aquatic systems are considered important and are protected habitats, proper delineation assessment(s) have been conducted identified aquatic systems.</p> <p>Climate Change Resilient Habitats – Tall trees along riparian vegetation or water channels act as carbon storage and it is advised that mature trees should be avoided during construction as they are critically important for climate change mitigation.</p> <p>River Corridors – in terms of ecological value, river corridors are home to ecosystems associated with the river, both aquatic and terrestrial, as well as those in between, forming an area of outstanding environmental value.</p> |
| 3 | Vegetation Types and their conservation classes | <p><u>Central Sandy Bushveld – Vulnerable</u> Total remaining: 13087.1 sqkm Conservation target: 19% (2486.5 sqkm or 248650 ha) Already conserved: 4.5% To be developed: Groot Nyl River Bridge ID. B447 and Major Box Culvert 3</p> <p><u>Springbokvlakte Thornveld – Endangered</u> Remaining Total: 4460.1 sqkm Conservation target: 19% (847.4 sqkm or 84740 ha) Already conserved: 3.6% To be developed: Major Box Culvert 1- IDC 3321 and Major Box Culvert 2 – IDC 3322</p> <p><u>Waterberg Mountain Bushveld - Least threatened</u> Remaining Total: 8532.3 sqkm Conservation target: 24% (2047.7 sqkm or 204770 ha) Already conserved: 9.3% To be developed: Modderloop Bridge ID. B375</p> |
| 4 | The construction of camps and material storage | <p>All camps and material storage areas should be established on already degraded habitats (no natural remain) and away from water (and riparian vegetation). This will ensure that all-natural habitats and untargeted areas are properly protected.</p> |
| 5 | The implication of the proposed development of new bridges with raised height and width (river crossing) | <p>Reduced water flow speed This will permit movement of aquatic species up and down the stream with ease and as such facilities movement and connectivity (DNA) of subpopulations along the river. Wildlife movement</p> |

| | | |
|---|--|---|
| | | <p>The proposed design of the bridges will not only aid people through safe/enhanced traffic flow, but also wildlife crossing between the two fragments of the same habitat. The bridge is anticipated to cover also riparian vegetation along the riverbanks (both sides) and by so doing allowing small to medium sized fauna to cross safely and effectively under the bridge (avoiding road-kills and accidents).</p> |
| 6 | Introduction of alien invasive species | <p>An alien invasive species eradication management plan for during and post development is going to be critical for rehabilitation of all affected watercourses/areas.</p> |

4.2. Review of LEDET Data



| | | | | | | | | | | | | | | | |
|--|--|------|---|------|---|------|---|------|---|------|---|-----|---|-----|---|
| CBA Map: | | | | | | | | | | | | | | | |
| CBA categories affected: | <table border="1"> <tr> <td>PA</td> <td></td> <td>CBA1</td> <td>X</td> <td>CBA2</td> <td>X</td> <td>ESA1</td> <td>X</td> <td>ESA2</td> <td>X</td> <td>ON</td> <td>X</td> <td>NNR</td> <td>X</td> </tr> </table> | PA | | CBA1 | X | CBA2 | X | ESA1 | X | ESA2 | X | ON | X | NNR | X |
| PA | | CBA1 | X | CBA2 | X | ESA1 | X | ESA2 | X | ON | X | NNR | X | | |
| Land management objectives in proposed development area: | <p>Critical Biodiversity Area 1 (CBA1)</p> <ul style="list-style-type: none"> Maintain in a natural state with limited or no biodiversity loss. Rehabilitate degraded areas to a natural or near natural state and manage for no further degradation. <p>Critical Biodiversity Area 2 (CBA2)</p> <ul style="list-style-type: none"> Maintain in a natural state with limited or no biodiversity loss. Maintain current agricultural activities. Ensure that land use is not intensified and that activities are managed to minimize impact on threatened species. <p>Ecological Support Area 1 (ESA1)</p> <ul style="list-style-type: none"> Maintain ecosystem functionality and connectivity allowing for limited loss of biodiversity pattern <p>Ecological Support Area 2 (ESA2)</p> <ul style="list-style-type: none"> Avoid additional/new impacts on ecological processes. | | | | | | | | | | | | | | |
| Compatible Land Uses | <p>Critical Biodiversity Area 1 (CBA1)</p> <ul style="list-style-type: none"> Conservation and associated activities. Extensive game farming and eco-tourism operations with strict control on environmental impacts and carrying capacities, where the overall there is a net biodiversity gain. Extensive Livestock Production with strict control on environmental impacts and carrying capacities. Required support infrastructure for the above activities. Urban Open Space Systems <p>Critical Biodiversity Area 2 (CBA2)</p> <ul style="list-style-type: none"> Current agricultural practices including arable agriculture, intensive and extensive animal production, as well as game and ecotourism operations, so long as these are managed in a way to ensure populations of threatened species are maintained and the ecological processes which support them are not impacted. Any activities compatible with CBA1. <p>Ecological Support Area 1 (ESA1)</p> <ul style="list-style-type: none"> Conservation and associated activities. | | | | | | | | | | | | | | |

| | |
|--|--|
| | <ul style="list-style-type: none"> • Extensive game farming and eco-tourism operations. • Extensive Livestock Production. • Urban Open Space Systems. • Low density rural residential, smallholdings or resorts where development design and overall development densities allow maintenance of ecological functioning. <p>Ecological Support Area 2 (ESA2)</p> <ul style="list-style-type: none"> • Existing activities (e.g. arable agriculture) should be maintained, but where possible a transition to less intensive land uses or ecological restoration should be favoured. |
| <p>Incompatible Land Uses</p> | <p>Critical Biodiversity Area 1 (CBA1)</p> <ul style="list-style-type: none"> • Urban land-uses including Residential (including golf estates, rural residential, resorts), Business, Mining & Industrial; • Infrastructure (roads, power lines, pipelines). • Intensive Animal Production (all types including dairy farming associated with confinement, imported foodstuffs, and improved/irrigated pastures). • Arable Agriculture (forestry, dry land & irrigated cropping). • Small holdings. <p>Critical Biodiversity Area 2 (CBA2)</p> <ul style="list-style-type: none"> • Urban land-uses including Residential (including golf estates, rural residential, resorts), Business, Mining & Industrial; • Infrastructure (roads, power lines, pipelines). • More intensive agricultural production than currently undertaken on site. • Note: Certain elements of these activities could be allowed subject to detailed impact assessment to ensure that developments were designed to CBA2. Alternative areas may need to be identified to ensure the CBA network still meets the required targets. <p>Ecological Support Area 1 (ESA1)</p> <ul style="list-style-type: none"> • Urban land-uses including Residential (including golf estates), Business, Mining & Industrial; • Infrastructure (roads, power lines, pipelines). • Intensive Animal Production (all types including dairy farming associated with confinement, imported foodstuffs, and improved/irrigated pastures). • Arable Agriculture (forestry, dry land & irrigated cropping). • Note: Certain elements of these activities could be allowed subject to detailed impact assessment to ensure that developments were designed to maintain overall ecological functioning of ESAs. <p>Ecological Support Area 2 (ESA2)</p> <ul style="list-style-type: none"> • Any land use or activity that results in additional impacts on ecological functioning mostly associated with the intensification of land use in these areas (e.g. Change of floodplain from arable agriculture to an urban land use or from recreational fields and parks to urban). |
| <p>General Recommendations:</p> | <p>Critical Biodiversity Area 1 (CBA1)</p> <ul style="list-style-type: none"> • No further loss of natural habitat should occur i.e. land in this category should be maintained as natural vegetation cover as far as possible; • These areas of land can act as possible biodiversity offset receiving areas <p>Critical Biodiversity Area 2 (CBA2)</p> <ul style="list-style-type: none"> • Loss of natural habitat should be minimized i.e. land in this category should be maintained as natural vegetation cover as far as possible; • These areas of land can act as possible biodiversity offset receiving areas; • Control of illegal activities (such a hunting and dumping), which impact biodiversity should be prioritized in CBA areas. |

| | |
|------------------------------------|--|
| | <p>Ecological Support Area 1 (ESA1)</p> <ul style="list-style-type: none"> • Maintain in a functional state, avoid intensification of land-uses, and rehabilitate to a natural or semi-natural state where possible. In transformed areas which are important for maintaining ecological processes, current land uses should be maintained, intensification of use (e.g. a transition from agriculture to urban) should be avoided, and where possible areas should be rehabilitated. • No further loss of natural habitat should be allowed, and land in this category currently in a degraded state should be rehabilitated or restored to a natural or semi-natural state once the current land-use has ceased; • Maintain current land uses where these play a role in supporting ecological processes; • Ensure land use changes do not impact negatively on ecological processes. • The maintenance of connectivity between CBAs, continued ecosystem functioning within the CBA corridors, and the prevention of degradation of adjacent Critical Biodiversity Areas must be achieved; <p>Ecological Support Area 2 (ESA2)</p> <ul style="list-style-type: none"> • Additional impacts on ecological processes should be avoided. • In transformed areas, which are important for maintaining ecological processes, current land uses should be maintained, intensification of use (e.g. a transition from agriculture to urban) should be avoided, and where possible areas should be rehabilitated. • The maintenance of connectivity between CBAs, continued ecosystem functioning within the CBA corridors, and the prevention of degradation of adjacent Critical Biodiversity Areas must be achieved; |
| <p>Land Management Guidelines:</p> | <p>Critical Biodiversity Area 1 (CBA1)</p> <ul style="list-style-type: none"> • Rezoning of properties to afford additional land-use rights that will result in increased biodiversity loss should not be granted; • Permission to increase the permitted number of units per erf or per ha should not be granted; • Developments should be limited to existing developed / degraded footprints, if present; • Units carefully dispersed or clumped to achieve least impact, particularly with regard to habitat loss and fragmentation; • The installation of infrastructure in CBAs is not desirable and should only be considered if all alternative alignment and design options have been assessed and found to be non-viable. Under such conditions, at least a Basic Assessment (BA) should be undertaken, and if approved, a comprehensive EMP must be developed and best-practice restoration efforts strictly implemented; • Ecological Specialist to conduct the ecological assessment; • If the development is 'incompatible' with CBA1 (see above): <ul style="list-style-type: none"> ○ A Screening Exercise should be undertaken by a Biodiversity Specialist or Ecologist to verify the CBA map category on site; ○ If the site is verified as a CBA, developments other than the preferred biodiversity-compatible land-uses should be investigated in detail and the mitigation hierarchy applied in full; ○ If the application is pursued they should be informed by a specialist biodiversity assessment. <p>Critical Biodiversity Area 2 (CBA2)</p> |


- Rezoning of properties to afford additional land-use rights that will result in increased biodiversity loss through conversion of land from agriculture should not be granted;
- Permission to increase the permitted number of units per erf or per ha should not be granted;
- Developments should be limited to existing footprints, if present, and should avoid encroaching on natural or agricultural landscapes;
- Should additional infrastructure be required, the requirements of threatened species should be considered. At least a Basic Assessment (BA) should be undertaken for any development which results in the intensification of land use, and if intensification of land use is approved, a comprehensive EMP must be developed to minimize impacts on threatened species;
- Ecological Specialist to conduct the ecological assessment;
- If the development is 'incompatible' with CBA2 (see above):
 - A Screening Exercise should be undertaken by a Biodiversity Specialist or Ecologist to verify the CBA map category on site;
 - If the site is verified as a CBA, developments other than the preferred biodiversity-compatible land-uses should be investigated in detail and the mitigation hierarchy applied in full;
 - If the application is pursued, they should be informed by a specialist biodiversity assessment.

Ecological Support Area 1 (ESA1)

- Rezoning of properties to afford additional land-use rights that will result in increased impact on ecological processes should not be granted, unless significant net conservation gains can be achieved, ecosystem functioning and connectivity of Ecosystem Support Areas (ESAs) will not be compromised, and biodiversity impacts regarding species and habitats are of at an acceptable significance and mitigated where possible.
- Developments should be limited to existing developed / degraded footprints, where possible.
- Units carefully dispersed or clumped to achieve least impact, particularly regarding impacts on ecological processes.
- Ecological Specialist to conduct the ecological assessment.
- If the development is incompatible with ESA1:
 - A Screening Exercise should be undertaken by a Biodiversity Specialist or Ecologist to verify the CBA map category on site.
 - If the site is verified as an ESA, developments other than the preferred biodiversity-compatible land-uses should be carefully screened to ensure that developments are planned, and activities undertaken in a way that minimizes impact on ecological processes. Impacts should be mitigated.
 - If the application is pursued, they should be informed by a specialist biodiversity assessment.
- If the development area is transformed but important for maintaining ecological processes:
 - Current land uses should be maintained, intensification of use (e.g., a transition from extensive agriculture to urban) should be avoided, and where possible areas should be rehabilitated.
 - Developments should be screened to ensure that they do not have an unacceptable impact on ecological processes.

Ecological Support Area 2 (ESA2)

- Where infrastructure is proposed:

| | | | | | |
|---|---|-----|-------------------------------------|----|-------------------------------------|
| | <ul style="list-style-type: none"> ○ Infrastructure should be designed to avoid additional impacts on ecological processes. ● If the development area is transformed but important for maintaining ecological processes: <ul style="list-style-type: none"> ○ Current land uses should be maintained, intensification of use (e.g., a transition from extensive agriculture to urban) should be avoided, and where possible areas should be rehabilitated. ○ Developments should be screened to ensure that they do not have an unacceptable impact on ecological processes. | | | | |
| <p>Drivers of CBA/ESA category designation:</p> |  | | | | |
| <p>Is the development compatible with the CBA Map?</p> | <table border="1"> <tr> <td>Yes</td> <td><input type="checkbox"/></td> <td>No</td> <td><input checked="" type="checkbox"/></td> </tr> </table> | Yes | <input type="checkbox"/> | No | <input checked="" type="checkbox"/> |
| Yes | <input type="checkbox"/> | No | <input checked="" type="checkbox"/> | | |
| <p>Does the application address all CBA requirements?</p> | <table border="1"> <tr> <td>Yes</td> <td><input type="checkbox"/></td> <td>No</td> <td><input checked="" type="checkbox"/></td> </tr> </table> | Yes | <input type="checkbox"/> | No | <input checked="" type="checkbox"/> |
| Yes | <input type="checkbox"/> | No | <input checked="" type="checkbox"/> | | |
| <p>If 'No' above, what still needs to be addressed?</p> | <ul style="list-style-type: none"> ● Sampling should factor-in all sections of R101 Road earmarked for development (five/04/5 sites along the road). ● A study of Aquatic Invertebrates and fish on both up and down-stream of all perennial rivers before and after development should be conducted – this will be used as a water quality indicator and quantify the impacts (if any) caused by the development earlier. ● All supporting infrastructure (camps and material storage) anticipated to be developed should also be identified and included in the sampling (preferably on already degraded areas as directed by the Waterberg Bioregional Plan). | | | | |

| | |
|---|---|
| <p>Land Cover Map:</p> | |
| <p>Land Cover Description</p> | <ul style="list-style-type: none"> • Cultivation: recently cropped all • Urban industrial/transport • Urban residential • Urban new development • 10m Bare • 10m Bush • 10m Open bush • Erosion dongas <p>Majority of the development is proposed to be constructed on already degraded areas except for the Nyl River bridge. Care should be taken to safeguard the ecosystem around the Nyl River bridge – a buffer zone of a conservative distance should be established and demarcated.</p> |
| <p>Threatened & Protected Ecosystems</p> | |
| <p>Threatened & Protected Species</p> | <ul style="list-style-type: none"> • Central Sandy Bushveld – Vulnerable • Springbokvlakte Thornveld – Endangered • Aquatic Ecosystem |

| | |
|------------------------|--|
| Additional Information | <ul style="list-style-type: none">Special attention should be placed on Aquatic culture and Riparian vegetation |
| Summary of Findings | <ul style="list-style-type: none">The segments of the R101 Road to be upgraded in the Basic Assessment Report (Page 16, Figure 4) are not correlating to the Biodiversity Report sampling points and as such a realignment is required.The most sensitive ecosystem services under threat are Aquatic Habitats, Climate Change Resilience, and River Corridors, specific threats should be anticipated and mitigated effectively and sustainably.All camps and material storage areas should be established on already degraded habitats (no natural remain) and away from water (and riparian vegetation).An alien invasive species eradication management plan for during and post development should be developed and implemented. |

5. RECOMMENDATIONS

- It is recommended that the above comments are taken into consideration.



S. I. Chuene Pr.Sci.Nat.: Ecological Science
(Ecological Scientist, Biodiversity Management)

RECOMMENDED

NOT RECOMMENDED

RECOMMENDED AS AMENDED

Please create summary of findings above.



E. T. Moeng Pr.Sci.Nat.: Botany
(Director: Biodiversity Management)

27/07/2024

Date