



Transnet Ports Authority (TNPA)

TERRESTRIAL BIODIVERSITY IMPACT ASSESSMENT REPORT (INCL. ANIMAL AND PLANT SP.)

DEVELOPMENT OF NEW BERTH 605 AND ASSOCIATED
INFRASTRUCTURE TO SUPPORT THE CONTAINER HANDLING FACILITY,
PORT OF RICHARDS BAY, KWAZULU-NATAL





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EXECUTIVE SUMMARY

WSP Group Africa (Pty) Ltd (WSP) has been appointed by Transnet National Ports Authority (TNPA) a Division of Transnet SOC Ltd for the development of Berth 605 Container Handling Facility and associated infrastructure located within the Port of Richards Bay (PoRB), KwaZulu-Natal (KZN) Province.

This report presents the findings of the terrestrial specialist assessment (inclusive of animal and plant species themes) to assess the potential impacts of the proposed Project on terrestrial biodiversity receptors, i.e. terrestrial vegetation communities, ecosystems and associated flora and fauna species.

This specialist assessment took cognisance of Government Notice No. 320 and Notice No. 1150, published in 2020 under the National Environmental Management Act (1998) concerning 'Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Theme in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act (1998), when applying for Environmental Authorisation.

The screening tool assessment flagged the Project area to have the following sensitive characteristics:

- Critical Biodiversity Areas (CBA) 1: Irreplaceable.
- National Protected Areas Expansion Strategy (NPAES).
- Endangered Maputaland Coastal Belt.

Further desktop assessment flagged the Project area in proximity to the following:

- Key Biodiversity Area 'Richards Bay Coast (100896)',
- Important Bird Area 'Richards Bay Game Reserve' 1.48 km South of the Project area.

To ground-truth these preliminary findings, field surveys of the development footprint, referred to as the Local Study Area (LSA), and immediate surrounds, were conducted from the 22 -25th October 2024 and 20- 23rd February 2025 by a terrestrial ecologist. The objectives of these biodiversity surveys (terrestrial, plant and animal species) were to:

- Confirm the habitat condition of accessible areas mapped as CBA Irreplaceable areas (i.e. natural or transformed).
- Assess the suitability of the Project area for the support of terrestrial plant, invertebrate, mammal, herpetofauna and avifauna Species of Conservation Concern (SCC) with potential to occur within the proposed Project footprint and surrounds, as indicated by the screening tool, to scope the site verification and impact assessment.
- Identify any further specialist studies required.
- Identify priority areas/sensitive habitats present.

The findings of the desktop and infield surveys identified the presence of five (5) main habitat units in the LSA, including:

- Completely Transformed Area (Low Site Ecological Importance (SEI)).
- Secondary Grasslands and Woodlands (Low SEI).
- Moist Grasslands (Medium SEI).
- Coastal Forest (High SEI).
- *Bruguiera gymnorhiza* mangrove forests (Very High).

The site surveys confirmed the presence of a high diversity of plant and animal species associated with the habitats present within the LSA. Of significance, twelve (12) plant SCCs were either confirmed present or likely to occur based on the habitat suitability, and forty-three (43) SCC faunal species were confirmed present, likely to occur, or possibly occurring in the study area based on habitat availability and suitability.

An impact assessment was undertaken to determine the potential impacts of the proposed development on the terrestrial biodiversity, fauna and flora receptors identified within the LSA, and to identify appropriate mitigation measures to address potential impacts in line with the mitigation hierarchy. The construction and operation of the proposed new infrastructure is anticipated to result in the following key impacts on terrestrial biodiversity receptors:

- Direct impacts through clearing of land and resultant loss of biodiversity (flora and fauna SCC) as well as ecosystems of concern.
- Establishment and spread of alien and invasive species.
- Loss and fragmentation of faunal habitats.

The below table provides a summary of the terrestrial biodiversity, fauna and flora sensitivities as per the initial DFFE screening tool outcomes and based on the site sensitivity verification and details the required mitigation actions to ensure that impacts to sensitive receptors are managed within acceptable limits.

Theme	Screening tool sensitivity	Site-Based sensitivity	Required action for development to proceed
Terrestrial biodiversity	VERY HIGH Estuarine Habitat and Maputoland Coastal Grassland Habitat.	Very High CBA 1 (Critical Biodiversity Area Irreplaceable) forests and estuarine habitat with various confirmed Species of Conservation Concern (SCC).	A Biodiversity Offset Plan (BOP) is required after all mitigation measures have been investigated and deemed ineffective at lowering the impact on terrestrial biodiversity receptors. This is to account for the loss of habitat within a CBA 1 confirmed terrestrial environment and to ensure no net loss. As per the offset guidelines a 30:1 offset ratio is recommended for CBA1. However, a lesser ratio could be motivated based on the site-specific characteristics. A lesser offset ratio could only be confirmed on consultation with, and written confirmation from, EKZN (Ezemvelo KZN Wildlife) and the DFFE (Department of Fisheries, Forestry and the Environment).
		Low ■ Transformed Habitat, Secondary Grasslands/Woodlands	Application of the recommended mitigation measures as detailed in this report.

Theme	Screening tool sensitivity	Site-Based sensitivity	Required action for development to proceed
Animal species	HIGH	High <ul style="list-style-type: none"> Animal species abundance and diversity in forests and estuaries with multiple confirmed Animal SCC. Likely presence of Endangered Pickersgill Reed Frog (<i>Hyperolius pickersgilli</i>). This will be further clarified in the BOP (Biodiversity Offset Plan by a Herpetofauna specialist). 	<ul style="list-style-type: none"> Separate Herpetology specialist study is required to assess the presence of the Endangered Pickersgill Reed Frog (<i>Hyperolius pickersgilli</i>) as well as the species abundance and habitat requirements of the Vulnerable Green Mamba (<i>Dendroaspis angusticeps</i>) and the Near Threatened Serato's Dwarf Chameleon (<i>Bradypodion setaroi</i>). This study will be undertaken in the BOP phase. Search and Rescue of all SCC animals recorded in the footprint and relocation to suitable habitat in the biodiversity offset area identified, should be conducted by a terrestrial ecologist to ensure correct identification of sensitive species and oversee the translocation of said species to suitable habitat. and translocation of species.
		Low <ul style="list-style-type: none"> Transformed Habitat, Secondary Grasslands/Woodlands 	Application of the recommended mitigation measures as detailed in this report.
Plant species	MEDIUM	Medium <ul style="list-style-type: none"> Plant species abundance, diversity and SCC presence is high in forests and estuaries. 	<ul style="list-style-type: none"> Search and Rescue of SCC plants recorded in the footprint and relocation to suitable habitat in the identified Biodiversity offset area by a terrestrial Ecologist. Where mature SCC trees are involved, budget should instead be reallocated to increasing the Terrestrial Offset area. Due to the high sensitivity's present in the LSA, an ECO should oversee the project phases.
		Low <ul style="list-style-type: none"> Transformed Habitat, Secondary Grasslands/Woodlands 	Application of the recommended mitigation measures as detailed in this report.

It is critical to recognise that a Biodiversity Offset Plan (BOP) is mandatory as all recommended mitigation measures have proven insufficient to reduce the project's impact on terrestrial biodiversity receptors. The BOP specifically addresses residual impacts and ensures that the complete removal of confirmed Critical Biodiversity Area (CBA) 1 terrestrial environments is properly accounted for.

In addition to the BOP, a dedicated Herpetology specialist study is required. This study must thoroughly investigate the presence of the Endangered Pickersgill Reed Frog (*Hyperolius pickersgilli*), in addition to other SCC's identified within the project area, such as the Vulnerable Green Mamba (*Dendroaspis angusticeps*) and the Near Threatened Serato's Dwarf Chameleon (*Bradypodion setaroi*).

The results from the specialist Herpetology study will provide crucial details on the habitat requirements and exact locations of Species of Conservation Concern (SCCs). This information is vital to plan and carry out a focused Search and Rescue operation, which will include not only reptile SCCs but also all other animal and plant SCCs identified in the report.

Each of these components—implementation of mitigation measures, preparation of a Biodiversity Offset Plan, and completion of a specialist herpetological assessment—are **non-negotiable** steps. Together, they form a comprehensive approach required to effectively safeguard biodiversity and comply with regulatory and ethical obligations for the development project.

ABBREVIATIONS AND ACRONYMS

AIP	Alien Invasive Plant
AOO	Area of Occupancy
BMP	Biodiversity Management Plan
BOP	Biodiversity Offset Plan
CBA	Critical Biodiversity Area
CBD	Convention on Biological Diversity
CITES	Convention on International Trade of Wild Fauna and Flora Endangered Species
DFFE	Department of Forestry, Fisheries and the Environment
DWAF	Department of Water Affairs and Forestry
DWS	Department of Water and Sanitation
EEZ	Exclusive Economic Zone
EFZ	Estuarine Functional Zone
EKZN	Ezemvelo KZN Wildlife
EIA	Environmental Impact Assessment
ESA	Ecological Support Area
EOO	Extent of Occurrence (EOO)
IBA	Important Bird Area
IUCN	International Union for Conservation of Nature
KBA	Key Biodiversity Area
KZNBSP	KZN Biodiversity Sector Plan
KZN	KwaZulu-Natal
LSA	Local Study Area
NBA	National Biodiversity Assessment
NEMA	National Environmental Management Act (Act 107 of 1998) as amended
NWA	The National Water Act (Act 36 of 1998) as amended
PCT	Point Container Terminal
PES	Present Ecological State
PoRB	Port of Richards Bay
RSA	Regional Study Area
SAMSA	South African Maritime Safety Authority
SANBI	South African National Biodiversity Institute
SCC	Species of Conservation Concern
SEI	Site Ecological Importance
TEUs	Twenty-foot Equivalent Units
TNPA	Transnet National Ports Authority
WSP	WSP Group Africa (Pty) Ltd

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Declaration Of Independence by Specialist

I, Sandhya Moodley, declare that I –

Act as the independent specialist in this application.

Do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed.

Do not have nor will have a vested interest in the proposed activity proceeding.

Have no, and will not engage in, conflicting interests in the undertaking of the activity; and undertake to disclose, to the competent authority, any information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document.



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Do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed.

Do not have nor will have a vested interest in the proposed activity proceeding.

Have no, and will not engage in, conflicting interests in the undertaking of the activity; and undertake to disclose, to the competent authority, any information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document.



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DECLARATION OF INDEPENDENCE BY SPECIALIST

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Act as the independent specialist in this application.

Do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed.

Do not have nor will have a vested interest in the proposed activity proceeding.

Have no, and will not engage in, conflicting interests in the undertaking of the activity; and undertake to disclose, to the competent authority, any information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document.



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25-Sep-25

1. INTRODUCTION AND BACKGROUND

WSP Group Africa (Pty) Ltd (WSP) has been appointed by TNPA for the development of Berth 605 Container Handling Facility and associated infrastructure located within the PoRB, KZN Province (Figure 1-1).

The TNPA functions in terms of the National Ports Act (No.12 of 2005) in which TNPA is responsible for the provision of port services and facilities within all ports of South Africa. In its role as the master planner, the TNPA also plans to improve, develop and maintain port infrastructure. Various development opportunities were identified by TNPA across three precincts namely South Dunes, Newark and Bayvue and are reflected in the Port Development Framework Plan (PDFP) and the Port of Richards Bay Master Plan 2021 – 2035. The Berth 605 project is reflected in the Port Development Framework Plan (PDFP) and the PoRB Master Plan, 2021-2035 and forms part of the Bayvue Precinct. The physical extent of the PoRB makes it the largest port in South Africa however, given the location of the port and the proposed expansion, the environmental sensitivities at the site and surrounding the port must be considered.

1.1. PURPOSE OF THE REPORT

The purpose of the terrestrial ecological study is to establish a baseline of the current ecological state of the environment potentially affected by the developmental activities based on a review and consolidation of existing data for the area and supplemented by targeted field sampling. This baseline assessment will inform the development of the project area by detailing potential impacts to sensitive terrestrial biodiversity receptors and providing specific recommendations for mitigation aligned with current and applicable guidelines and protocols to ensure that the relevant South African biodiversity legislative and policy requirements are satisfactorily met.

This specialist assessment took cognisance of Government Notice No. 320 and Notice No. 1150, published in 2020 under the National Environmental Management Act (1998) concerning 'Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Theme in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act (1998), when applying for Environmental Authorisation, hereafter referred to as "the Protocols". The following environmental themes are covered in this report:

- Terrestrial Biodiversity
- Plant Species
- Animal Species

1.2. PROJECT LOCATION AND EXTENT

Berth 605 is located within the PoRB, King Cetshwayo District Municipality and Umhlathuze Local Municipality within the KwaZulu-Natal (KZN) Province. The approximate centre point co-ordinates for the Berth 605 project area are 28°47'23.82"S 32° 1'34.43"E (Figure 1-2). The project area is bounded by the rail line to the North, the current development for Berth 606 and 607 to the East, The Seafarers Club to the West and the basin for the 600 Series berths to the South.

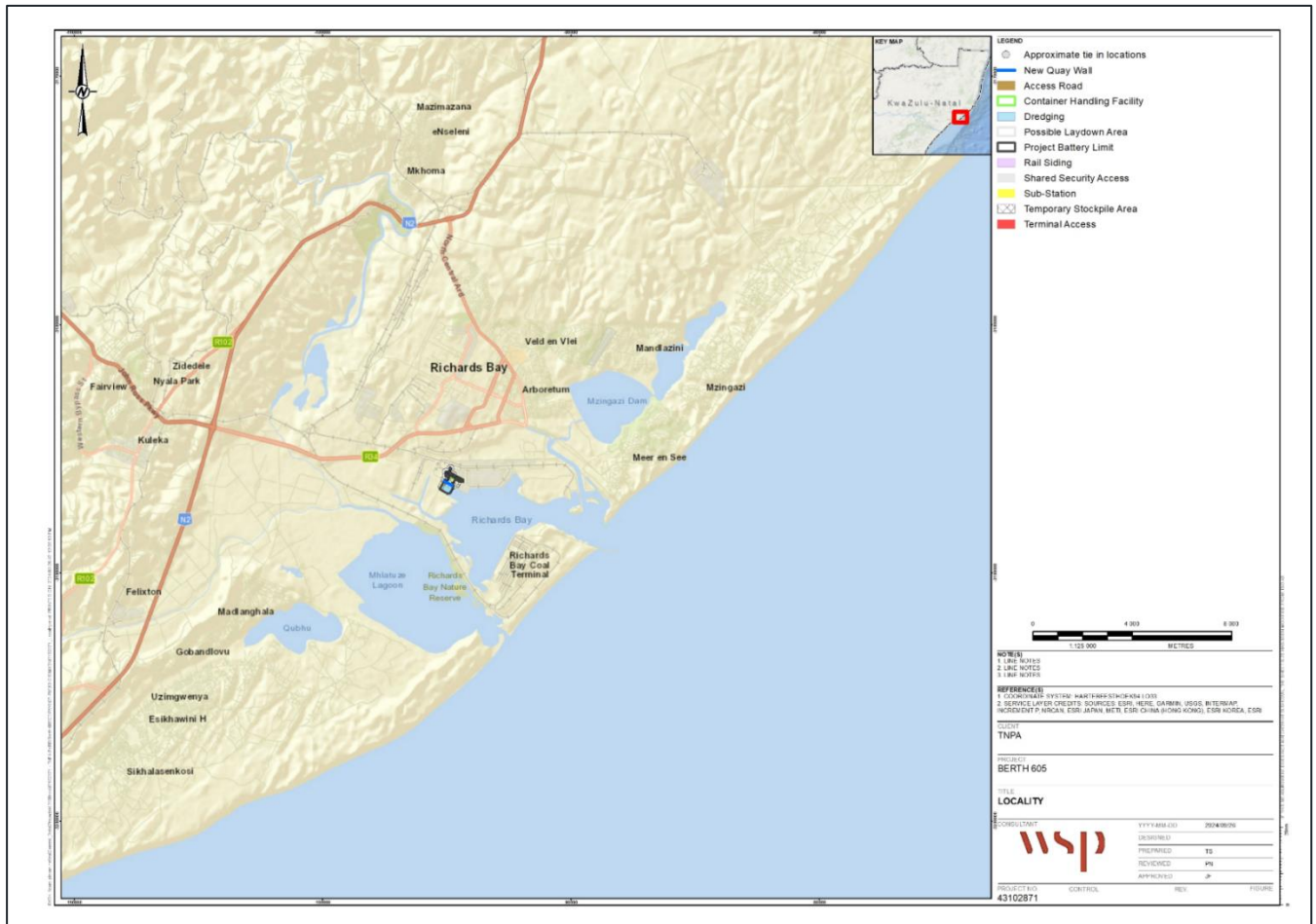


Figure 1-1 - Locality map of project area

The proposed Project infrastructure and associated components are described as follows (and as illustrated in Figure 1-2):

New berth pocket and quay wall

The new Berth 605 is to be maintained at a proclaimed depth of -14.5 m PCD to accommodate the design vessel. The design dredging depth will consider only the sedimentation and sounding accuracy, i.e. 0.6 m below -14.5m PCD, providing a design depth of -15.1 m PCD. The quay wall will be a mass concrete gravity wall with backfill infill. It will have a wide base and hollow in the middle to allow for the void to be backfilled with sand. This provides a wider footprint but a lower density which will result in a more stable foundation. The basin length (quay length) at -14.5 m PCD depth of 338 m was found to be sufficient, accepting overlap of the design vessel into the Berth 606 quay space, as was confirmed by the mooring analysis study. The quay wall is therefore expected to be 360 m in length considering the overlap. There will also be allowance for however the quay wall will be designed to accommodate a -19 CD depth for future dredging if required.

End of berth basin slopes

The Berth 605 must fit within the space between the end of the existing Berth 606 and the South Dunes Road. The location of the end of Berth 606 berth pocket is defined as the end of the existing

berth which is the lower retained earth wall. With a slope of 1V:3H from -14.5 CD to the existing ground level is 60 m long, this provides a total berth length of 338 m from the toe of the embankment to the start of Berth 606. This will support a vessel of 315 m Length Overall (LOA).

Scour protection

For the scour design, it is assumed that all sediment within the basin is erodible, representing a worst-case scenario. However, WSP acknowledges the presence of underlying rock layers in the area at depths ranging from -5 m CD to -17 m CD. These layers might impact the final design, but this will only be considered during the detailed design phase of the scour protection system. A revetment (sloped embankment) will be constructed on the seaward side of the Urania Road. This slope must be protected against wave and propeller action to maintain the structural integrity of the Urania Road. A riprap scour protection system will be considered.

Dredging

Dredging activities will be undertaken to a proclaimed depth of -14.5 m Chart Datum (CD) The design dredging depth will consider only the sedimentation and sounding accuracy, i.e. 0.6 m below -14.5m PCD, providing a design depth of -15.1 m PCD. There will also be allowance for however the quay wall will be designed to accommodate a -19 CD depth for future dredging if required.

Dredge disposal

An estimated 2.8 million cubic metres of dredged material will be disposed of at an authorised offshore disposal site.

New rail siding

The proposed rail siding design is based on the container handling facility design capacity of 1 million Twenty Foot Equivalent Units (TEUs) per annum, which differs from that of the other design components which caters for 275 000 TEU design throughput per annum. Based on the design throughput and the current requirement of a 50-wagon container train, it is proposed that the rail siding will consist of two rail lines that are 370m each in length, each servicing 2 rakes of 25-wagons each. The existing Mhlatauze Yard will be used for shunting and staging purposes to service the new proposed rail siding.

New access road

A new shared access road and vehicle access control point to the PoRB, the Container Handling Facility (CHF) and the adjacent vacant land surrounding the CHF is proposed. The new road will be an estimated 735 m length with a width of 30 m. It will consist of two (2) lanes each direction and three (3) intersections; at Urania Road, at Ventura Road and one to the container handling facility.

Footprint of the Container Handling Facility (CHF) and apron area

The CHF will be built and operated by the container handling facility operator therefore this S&EIR process only considers the disturbance footprint of the CHF and not the associated permits that it will require when operational. The total area considered is 6.75 Ha for the container handling facility. The apron area is an operational area located behind the quay wall and is used for the movement of trucks. The apron area is an estimated 33 m wide and 400 m in length.

Provision of electrical supply to feed the facility operations and equipment

The preferred alternative is applicable where the required electrical demand is within the available capacity of the current existing 11 kV network. A new feed will be taken from the existing 11 kV network to provide electrical power to the new container handling facility and quay wall. However, while there is existing capacity on the current 11 kV network, this is limited and may not be able to provide for the full electrical demands in the future. To protect against restricting future electrical supply constraints, a new 11 kV Switching Station fed from the existing Primary Substation is proposed.

Water

The existing 225mm diameter water main will be extended along with the new quay wall to supply ship water along the new quay. At the end of the new quay wall extension the water main will follow Urania Road to tie into the existing 150mm diameter pipe in the vicinity of the existing gate house. Connections to new buildings will be off takes from either the existing network directly, or via extensions to the existing network brought to the boundary of the proposed CHF. A tie in point will be provided. Connections to new buildings will be off takes from either the existing network directly, or via extensions to the existing network brought to the boundary of the proposed container handling facility. A tie in point will be provided which will consist of approximately 500 m of pipework with a diameter of 150 mm. Inside the quay wall, water will be provided to landing valves for ships and firefighting.

Sewerage

The existing sewer network has been evaluated to identify areas that require upgrades to accommodate the extension of the sewer network for the new proposed container handling facility. The sewerage system will allow for wastewater from new toilets, basins, baths, and showers. The proposed sewer will be designed to tie into the closest existing pipe network or an existing pump station closest to the proposed container handling facility. Sewerage inside the container handling facility will be designed to accommodate for approximately 160 people. The new sewerage pipeline will have a connection point at the northwestern boundary of the container handling facility. It will be approximately 100 m in length and 160 mm pipe diameter. The preferred alternative involves designing a sump to accommodate the facility's sewer through gravity flow, with pumping from the sump to the existing pumpstation PS20, located north of the facility. The final sewer pipe route will be determined during the design phase.

Stormwater

The existing stormwater network has been evaluated to identify areas that require upgrades to accommodate the extension of the stormwater network for the new proposed CHF. The existing stormwater network located east of the proposed CHF discharges into the basin through the existing quay wall. It is therefore proposed that the same principal apply with the new stormwater pipe through the new quay wall. Stormwater pipes will be installed to collect stormwater runoff from the container handling facility to the new quay wall. The pipeline will be approximately 360 m along the quay line and 400 m on the other side with a 900mm pipe diameter. It will have a velocity of 0.6 m/s for self-cleaning, to prevent sand settling inside the pipe and blocking. There will also be cross drainage at the new rail siding which will be 400 m in length and 600 mm diameter. The existing network discharges into the bay through the existing quay wall.

Provision for temporary laydown and stockpile areas

An approximate area of 4.2 Ha, 220 m in length and 170 m wide to be used as a potential lay down area for the project. In addition, two temporary stockpile areas are proposed. The first image is an area of approximately 2.4 Ha, 250 m in length and 100 m wide. The area is located SE of the CHF. The second area is split into two areas across the Harbour Arterial Road. These areas cover an area of approximately 6 Ha. The infilling of approximately 6 Ha of the basin is also being considered for stockpiling (this infilled area also forms part of the basin to be dredged).

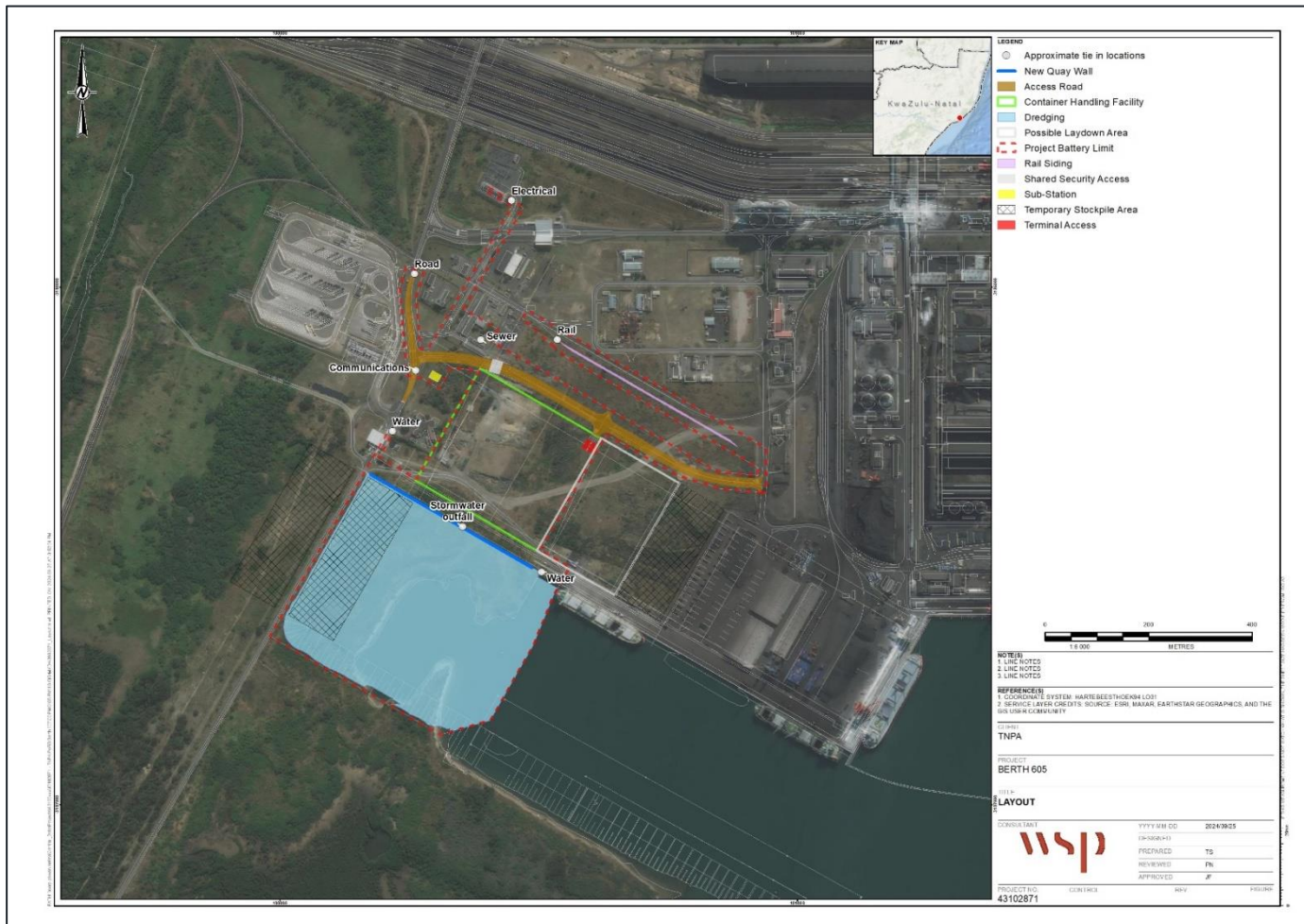


Figure 1-2 – Proposed site layout

2. APPLICABLE LEGISLATION, POLICY AND STANDARDS

Biodiversity-related South African legislation and policy that was used to guide this assessment is summarised in the sections below.

2.1. SOUTH AFRICAN LEGISLATION AND POLICY

Applicable national and provincial legislation, associated regulations and policies that are pertinent to biodiversity, which were used to guide this report include:

- National Environmental Management Act (NEMA) (Act No. 107 of 1998) as amended including Section 24, concerning Procedures for the assessment and minimum criteria for reporting on identified themes in terms of Sections 24(5)(a) and (h) and 44 of the NEMA, when applying for environmental authorisation.
- Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity, animal and plant species biodiversity.
- Convention on Biological Diversity (CBD, 1993).
- The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES 1973).
- The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention, 1979).
- National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEMBA), specifically:
 - ToPS – National lists of critically endangered, endangered, vulnerable and protected species (2007) and
 - National list of alien and invasive species (2016).
- The National Forests Act, 1998 (Act 84 of 1998), Section 3 states that “... natural forests may not be destroyed save in exceptional circumstances where, in the opinion of the Minister, a proposed new land use is preferable in terms of its economic, social or environmental benefits”. This prescribes that no development affecting forests may be allowed unless “exceptional circumstances” can be proven. Section 7 prohibits the cutting, disturbance, destruction or removal of any indigenous living or dead tree in a forest without a licence.
- Environmental Conservation Act (Act No. 73 of 1983) Natural Scientific Professions Act (Act No. 27 of 2003) National Biodiversity Framework (NBF, 2009).
- KwaZulu-Natal Nature Conservation Management Act (Act 29 of 1997).
- KwaZulu-Natal Nature Conservation Management Amendment Act (Act 5 of 1999).
- Natal Nature Conservation Ordinance 15 of 1974.
- National Water Act (Act No. 36 of 1998).
- Ezemvelo KZN Wildlife: Guideline: Biodiversity Impact Assessment in KwaZulu Natal (Version 2, February 2013).
- Guidelines for the implementation of the Terrestrial Fauna and Terrestrial Flora Species Protocols for environmental impact assessments in South Africa Version 1 (2020).
- Ecosystem Environmental Assessment Guideline: Draft Guidelines for the implementation of the Terrestrial and Aquatic Ecosystem Protocols for environmental impact assessments in South Africa Draft – 5 July 2021.
- KwaZulu-Natal Systematic Conservation Plan (EKZNW 2012).

- National Protected Area Expansion Strategy (2016).

Recent, relevant South African national policies and guidance were also taken into consideration, in the development of the baseline description, including:

- Draft National Biodiversity Offset Policy (2017).
- National Biodiversity Offset Guideline (2023): Per communication with EKZN, both terrestrial and estuarine features triggered the CBA 1 irreplaceable designation by the DFFE screening tool. Bearing this in mind, a terrestrial biodiversity BOP is required to address the loss of high value terrestrial habitat and the associated terrestrial species off concern. This requirement is therefore applicable unless written confirmation by both authorities is acquired.
- Species Environmental Assessment Guideline (SANBI, 2020).

Provincial protected species:

- KZN Conservation Ordinance 15 of 1974 Restrictions and requirements with regards to activities relating to the species listed is outlined in Sections 34 – 58 of the Ordinance.
 - Schedule 2 – Protected game
 - Schedule 3 – Specially protected game
 - Schedule 7 – Protected amphibians, invertebrates, and reptiles
 - Schedule 9 – Specially protected birds
 - Schedule 11 – Protected Indigenous plants
 - Schedule 12 – Specially protected indigenous plants
- KZN Nature Conservation Management Amendment Act, 1999 (No. 5 of 1999)
 - Schedule 4 – Specially protected indigenous animals
 - Schedule 5 – Protected indigenous animals
 - Schedule 6 – Specially protected indigenous plants
 - Schedule 7 – Protected indigenous plants
- KwaZulu-Natal Environmental, Biodiversity and Protected Areas Management Bill (Draft - 2014)
 - Schedule 3 – Protected animal species. Restricted activities include the following: Destroy, degrade or alter habitat in a way that causes or is likely to cause significant decline in the number of individuals of the species there; possess, breed, sell, make available for sale or otherwise trade in, buy, receive, give, donate or accept as a gift, or in any way acquire or dispose of, capture, collect, immobilise, kill, translocate, release, display, export, import or keep in captivity.
 - Schedule 4 – Restricted use protected animal species. Restricted activities include the following: Hunt, possess, breed, sell, make available for sale, or otherwise trade in, buy, receive, give, donate or accept as a gift, or in any way acquire or dispose of, capture, collect, immobilise, kill, translocate, release into the environment, display, export, import or keep in captivity.
 - Schedule 5 – Restricted use animal species. Restricted activities include the following: Hunt, release into the environment, keep in captivity, sell, make available for sale, or otherwise trade in, buy, receive, give, donate or accept as a gift, or in any way acquire or dispose of, capture, collect, immobilise, kill, translocate, display, export, import.
 - Schedule 7 – KwaZulu-Natal threatened plant species. Restricted activities involving wild or wild sourced specimens: Harvest, gather, collect, transport, convey, import, or export, have in possession or exercise physical control over or wilfully damage or destroy. Grow, breed or in

any other way propagate or cause to multiply for commercial purposes, sell, trade in or buy Restricted activities requiring a permit involving artificially propagated specimens: Have in possession or exercise physical control over, transport, convey, import or export from the province. Sell or trade-in, grow, breed or in any other way propagate, for commercial purposes.

- Schedule 8 – KwaZulu-Natal protected plant species. Restricted Activities requiring a permit involving wild or wild sourced plant specimens: harvest, gather, collect, transport, convey or export, sell, trade in. Endemic/near-endemic species Endemic and near-endemic species generally have restricted distributions and are often highly adapted to their home range; consequently, threats to endemics carry a higher risk of extinction than for broadly distributed species. Although many of these species have wide distributional ranges within the region and have a conservation status of Least Concern, with some ranking among our most widespread and abundant (i.e., Cape White-eye), all endemic/near-endemic species require some vigilance to ensure that their population numbers stay stable.

The table below outlines the acts/conventions referenced to guide this specialist assessment (Table 2-1).

Table 2-1 – Acts/Conventions referenced to guide this assessment.

Act/Convention	Significance to this assessment
The Constitution of the Republic of South Africa (108/1996)	In terms of Section 24 of the Constitution of South Africa, 1996 (No. 108 of 1996) “everyone has the right: <ul style="list-style-type: none"> a) to an environment that is not harmful to their health or well-being; and b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that. <ul style="list-style-type: none"> ■ Prevent pollution and ecological degradation. ■ Promote conservation; and ■ Secure ecologically sustainable development and use of natural; resources while promoting justifiable economic and social development”.
National Environmental Management Act (Act 107 of 1998) as amended	The National Environmental Management Act (NEMA) (as amended) establishes principles for decision making on matters that affect the environment, to provide for cooperative environmental governance. Activities that have the potential to impact on— (a) the environment; (b) socio-economic conditions; and (c) the cultural heritage, need to be identified and must be considered, investigated and assessed prior to their implementation and reported to the organ of state charged by law with authorizing, permitting, or otherwise allowing the implementation of such an activity. Activities that require authorisation are Listed in Listing Notices 1, 2 and 3 published in terms of the Environmental Impact regulations of 2014.
National Environmental Management: Protected Areas Act (Act 57 of 2003) as amended	The National Environmental Management: Protected Areas Act (as amended) primarily provides for the protection and conservation of ecologically sensitive areas and those which are representative of the Republic’s biological diversity.
National Environmental Management: Biodiversity Act (Act 10 of 2004) as amended	The National Environmental Management: Biodiversity Act (as amended) provides legal protection and management of South Africa’s biodiversity within the framework of NEMA and the sustainable use of biological resources, with the aim to manage and conserve South Africa’s biodiversity. The Act seeks to protect species and ecosystems that require national-level safeguarding. It promotes the sustainable utilisation of indigenous biological resources and emphasises the fair and equitable sharing of benefits derived from activities

Act/Convention	Significance to this assessment
	involving such resources. The legislation also establishes the South African National Biodiversity Institute (SANBI), defining its roles and functions.
Environmental Impact Assessment Regulations, 2014	The Environmental Impact Assessment (EIA) regulations promulgated in terms of Chapter 5 of NEMA control certain listed activities. These activities are prohibited until Environmental Authorisation has been granted by the competent authority.
Biodiversity Offset Guidelines (2023)	Under Section 24J of NEMA, the DFFE published National Biodiversity Offset Guidelines 2023 (Government Gazette 48841) to fulfil Section 2(4)(a)(i) of NEMA, which provides that “ <i>sustainable development requires the consideration of all relevant factors including the following: ... that the disturbance of ecosystems and loss of biodiversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied.</i> ” Government gazette No. 46088 (25 March 2022) defines the term “remedy” to include the rehabilitation and/or restoration of areas disturbed by development as well as biodiversity offsetting. Biodiversity offsetting is required when a proposed activity would have a significant residual negative biodiversity impact after all efforts have been made to avoid and minimise negative impacts on biodiversity and to rehabilitate and/or restore areas disturbed by development. The Guidelines note that the measures for ‘offsets’ must be read in the context of the mitigation hierarchy provided for in section 2(4)(a)(i) of NEMA as well as the Overall Policy on Environmental Offsetting. Per communication with EKZN, both terrestrial and estuarine features triggered the CBA 1 irreplaceable designation by the DFFE screening tool. Bearing this in mind, a terrestrial biodiversity BOP is required to address the loss of high value terrestrial habitat and the associated terrestrial species off concern. This requirement is therefore applicable unless written confirmation by both authorities is acquired.
Spatial Planning and Land Use Management Act (Act 16 of 2013)	The purpose of the Spatial Planning and Land Use Management Act is to establish a new framework for managing planning permissions and approvals, setting guidelines for new developments, and defining legal land uses in South Africa. It functions as a foundational law, outlining general principles for provincial laws that will manage planning. Additionally, the Act clarifies how planning law interacts with other legal regulations and policies.
Sea Birds and Seals Protection Act (Act 46 of 1973)	This legislation explicitly prohibits the harassment or unnecessary disturbance of seabirds and bans the killing, capture, or deliberate disturbance of these birds. The South African Policy on the Management of Seals, Seabirds, and Shorebirds (2007) commits the government to developing action plans aimed at reducing incidental mortality of seabirds, seals, and shorebirds caused by fishing operations.
National Heritage Resources Act (Act 25 of 1999)	<p>The National Heritage Resources Act provides the legal framework for the management of cultural and heritage resources in South Africa. In terms of Section 38 of the Act, it is required that a heritage assessment be undertaken before development or other activity which will change the character of a site, and for the responsible heritage resources authority be informed and granted the opportunity to provide feedback.</p> <p>The coastal protection zone consists of land falling within an area declared as a sensitive coastal area in terms of the Environment Conservation Act (Act No. 73 of 1989) (repealed by the National Heritage Resources Act).</p>
National Ports Act (Act No. 12 of 2005)	The National Ports Act 12 of 2005 is a South African law that provides for the establishment of the National Ports Authority and regulates the management and operations of South African ports. Sections 68 and 69 of this Act address specific matters related to offences and penalties under the law.

2.2. INTERNATIONAL

Relevant international conventions and treaties which have been ratified by the South African Government, and which have become law through promulgation of national legislation are listed in Table 2-2 below.

Table 2-2 - Ratified international conventions and treaties for the management and protection of marine biota and ecosystems.

Title	Description
The Convention on Biodiversity (1992)	The Convention on Biological Diversity (CBD) is an international treaty, of which South Africa is a member state, that aims to promote <i>"the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising out of the utilization of genetic resources."</i> Under the CBD, member states adopted of the Kunming-Montreal Global Biodiversity Framework in 2022 which aims to address biodiversity loss, restore ecosystems and protect indigenous rights. The plan includes concrete measures to halt and reverse nature loss, including putting 30 per cent of the planet and 30 per cent of degraded ecosystems under protection by 2030.
Convention on the Conservation of Migratory Species of Wild Animals (1983)	The Convention on the Conservation of Migratory Species of Wild Animals (CMS), also known as the Bonn Convention, of which South Africa is a party, is an environmental treaty of the United Nations which aims to conserve migratory species throughout their range. Of relevance is Article III (4): <i>"Parties that are Range States of a migratory species listed in Appendix I shall endeavour:</i> <ul style="list-style-type: none"> ■ To conserve and, where feasible and appropriate, restore those habitats of the species which are of importance in removing the species from danger of extinction. ■ To prevent, remove, compensate for or minimize, as appropriate, the adverse effects of activities or obstacles that seriously impede or prevent the migration of the species; and ■ To the extent feasible and appropriate, to prevent, reduce or control factors that are endangering or are likely to further endanger the species, including strictly controlling the introduction of, or controlling or eliminating, already introduced exotic species."
Agreement on the Conservation of Albatrosses and Petrels, (2004)	This Agreement protects all the world's albatross species, seven southern hemisphere petrel and two shearwater species. A number of these occur off the South Coast of South Africa.
Convention on International Trade of Wild Fauna and Flora Endangered Species (1973)	CITES is a multilateral treaty to protect endangered plants and animals.
World Heritage Convention Act (Act 49 of 1999)	This legislation enables the integration of the World Heritage Convention into the legal framework of South Africa. It encompasses the enforcement and execution of the World Heritage Convention within the country and addresses the development of comprehensive management plans for World Heritage Sites.

3. METHODOLOGY

This report aimed to develop an understanding of biodiversity constraints within the Project area, so that the terrestrial biodiversity, plant, and animal species sensitivity ratings can be verified and assessed in line with the assessment and reporting requirements set out in the Protocols. This assessment, therefore, included two main study components - a desktop literature review, which was then supplemented by wet season site assessments to inform the assessment of potential impacts, in line with the Protocols. The objectives and tasks associated with these components are described in the sections that follow.

3.1. STUDY AREA

The study area for the assessment was defined as follows:

- Local Study Area (LSA): The development footprint, i.e., the area in which the proposed development will take place, including the area that will be disturbed or impacted.
- Regional Study Area (RSA): The wider project development boundary, including a 500m buffer around the LSA to take into account faunal movement.

3.2. ENVIRONMENTAL SCREENING TOOL

The LSA was assessed at desktop level using the National Web-based Environmental Screening Tool (The Tool). According to the Tool, the following ratings overlap with the LSA/Project area.

- Terrestrial Biodiversity- Very High Sensitivity.
- Animal Species- High Sensitivity; and
- Plant Species- Medium Sensitivity.

The Terrestrial Biodiversity Theme for the Project area is rated 'Very High Sensitivity' (Figure 3-1) due to its overlap with areas classified as follows:

- Critical Biodiversity Areas (CBA) 1: Irreplaceable.
- National Protected Areas Expansion Strategy (NPAES); and
- Endangered Maputaland Coastal Belt.

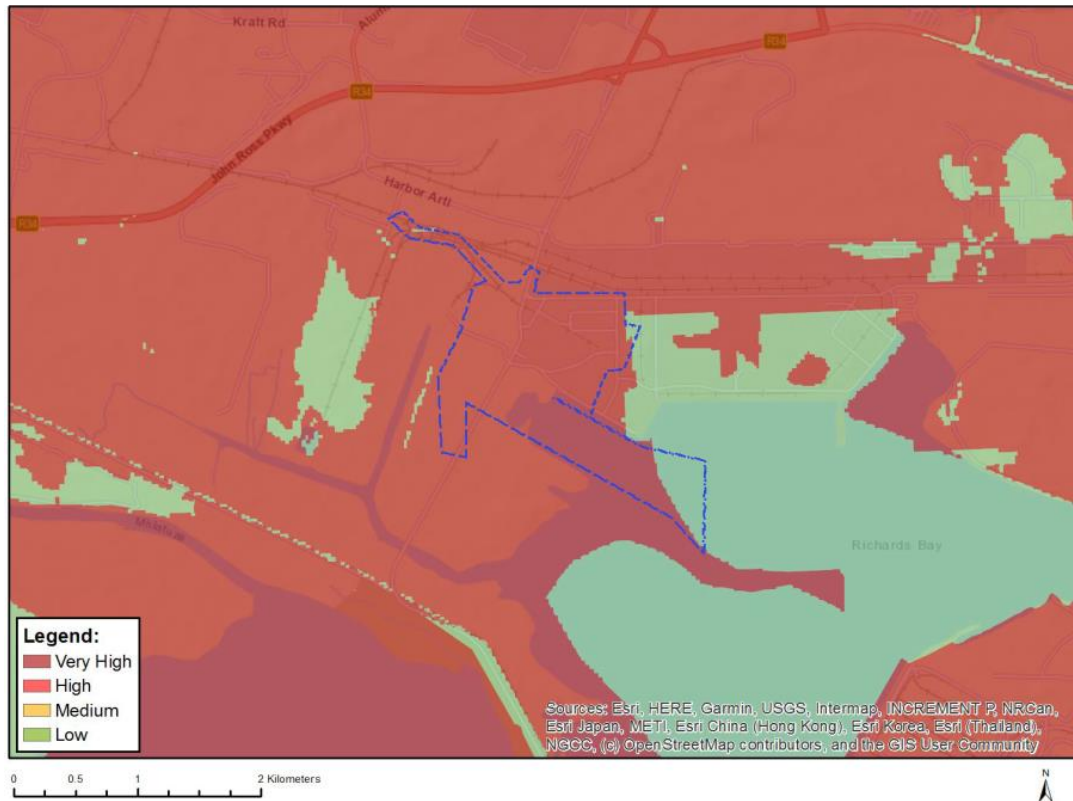


Figure 3-1 - Terrestrial Biodiversity Sensitivity

The National Web Based Screening Tool also indicated that the LSA is of 'Medium' sensitivity in terms of the Plant Species Theme (Figure 3-2) on account of the potential presence of at least 17 flora species of conservation concern (Table 3-1). Certain species names have been withheld due to their vulnerability to illegal harvesting in line with the SANBI protocol detailed for such cases.

Table 3-1 – Potentially occurring plant species of conservation concern flagged by the DFFE screening tool

Species Name	Conservation Status
<i>Sensitive species 89</i>	Vulnerable
<i>Sensitive species 1252</i>	Vulnerable
<i>Sensitive species 649</i>	Near Threatened
<i>Sensitive species 1221</i>	Vulnerable
<i>Sensitive species 191</i>	Vulnerable
<i>Aspalathus gerrardii</i>	Vulnerable
<i>Thesium polygaloides</i>	Vulnerable
<i>Freesia laxa subsp. Azurea</i>	Vulnerable
<i>Fimbristylis aphylla</i>	Vulnerable
<i>Pachycarpus concolor subsp. Arenicola</i>	Vulnerable
<i>Nidorella tongensis</i>	Endangered

Species Name	Conservation Status
<i>Senecio ngoyanus</i>	Vulnerable
<i>Wolffiella denticulata</i>	Vulnerable
<i>Cassipourea gummiflua</i> var. <i>verticillate</i>	Vulnerable
<i>Oxygonum dregeanum</i> subsp. <i>Streyi</i>	Endangered
<i>Pavonia dregei</i>	Vulnerable
<i>Zostera capensis</i>	Vulnerable

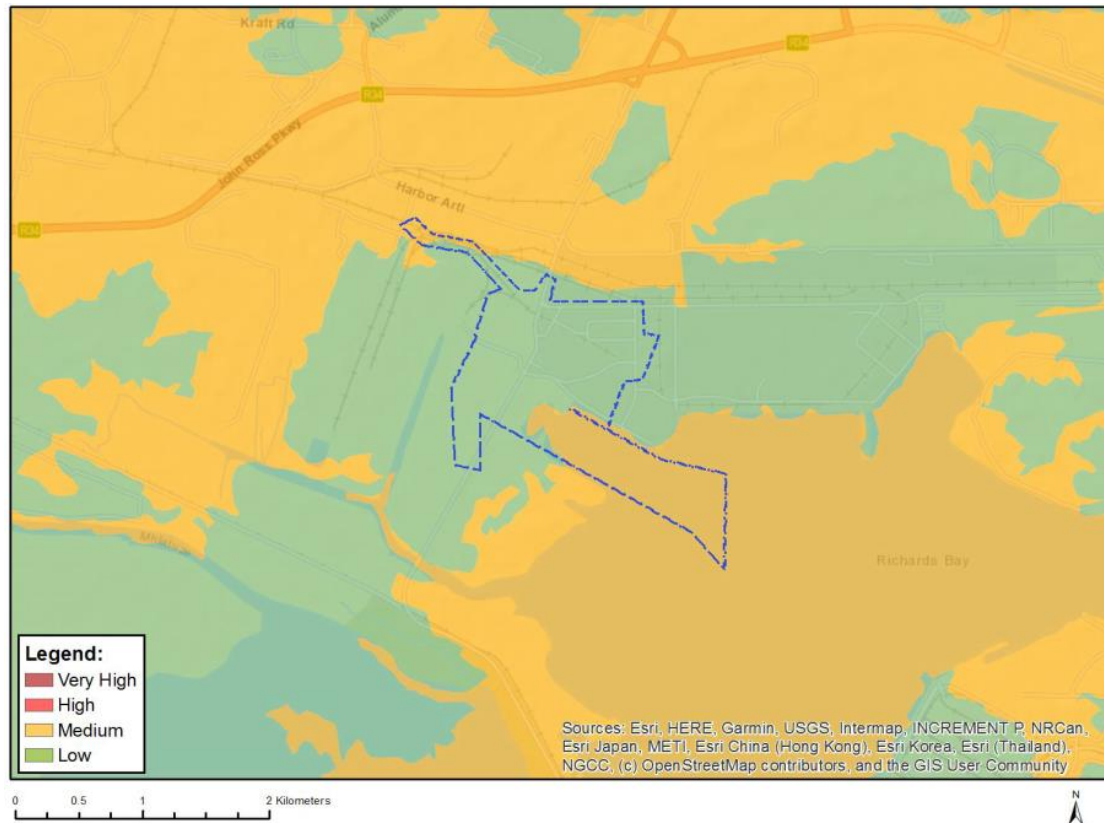


Figure 3-2 - Plant Species Sensitivity

The LSA is rated as 'High' sensitivity in terms of the Animal Species Theme (Figure 3-3) due to the potential presence of at least 25 animal species of conservation concern (Table 3-2). Certain species names have been withheld due to their vulnerability to illegal harvesting in line with the SANBI protocol detailed for such cases.

Table 3-2 - Potentially occurring animal species of conservation concern flagged by the DFFE screening tool.

Species Class	Species Name	Conservation Status
Mammals	<i>Sensitive species 8</i>	Vulnerable
Aves	<i>Podica senegalensis</i>	Endangered
	<i>Circus ranivorus</i>	Vulnerable

Species Class	Species Name	Conservation Status
	<i>Nettapus auritus</i>	Vulnerable
	<i>Stephanoaetus coronatus</i>	Vulnerable
	<i>Hydroprogne caspia</i>	Vulnerable
	<i>Neotis denhami</i>	Vulnerable
	<i>Balearica regulorum</i>	Endangered
	<i>Pelecanus onocrotalus</i>	Vulnerable
	<i>Microparra capensis</i>	Vulnerable
	<i>Halcyon senegaloides</i>	Endangered
	<i>Pelecanus rufescens</i>	Vulnerable
	<i>Ephippiorhynchus senegalensis</i>	Endangered
	<i>Circaetus fasciolatus</i>	Critically Endangered
	<i>Geokichla guttata</i>	Vulnerable
	<i>Aquila rapax</i>	Endangered
	<i>Mycteria ibis</i>	Endangered
	<i>Terathopius ecaudatus</i>	Endangered
Amphibia	<i>Hyperolius pickersgilli</i>	Endangered
Insecta	<i>Deloneura millari millari</i>	Rare
	<i>Teriomima zuluana</i>	Vulnerable
Reptilia	<i>Crocodylus niloticus</i>	Vulnerable
	<i>Pelusios rhodesianus</i>	Vulnerable
Invertebrate	<i>Arytropteris basalis</i>	Vulnerable
	<i>Pomatonota dregii</i>	Vulnerable

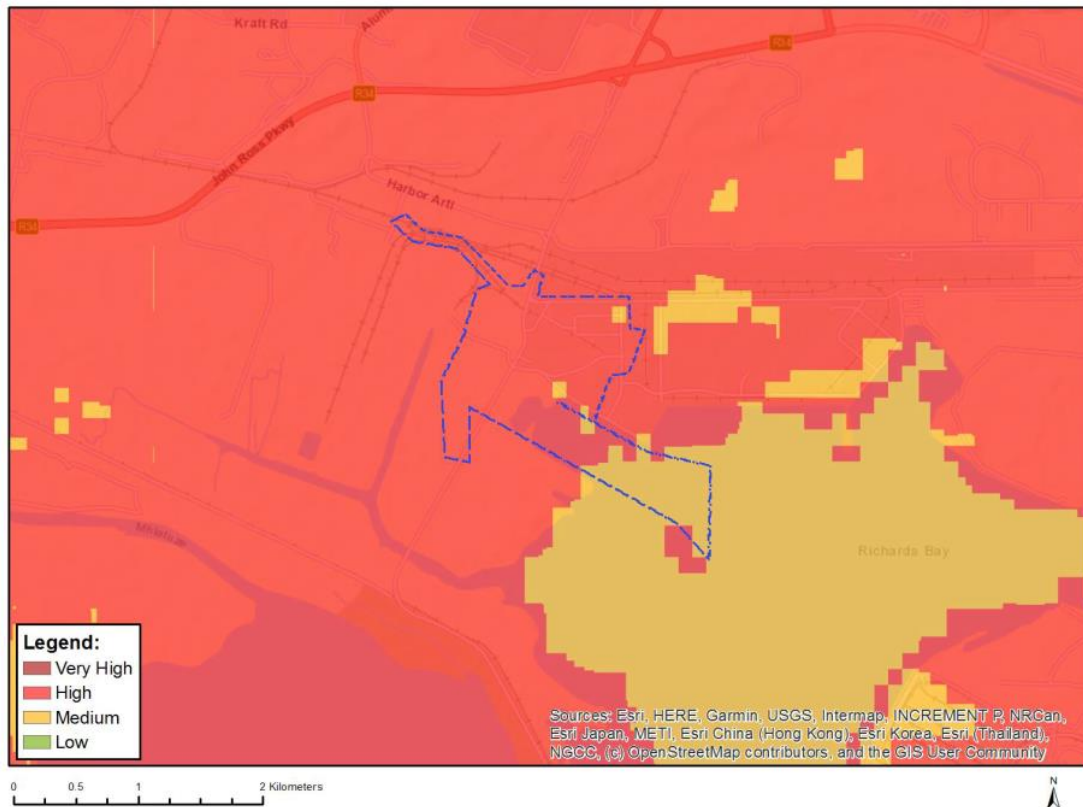


Figure 3-3 - Animal Species Sensitivity

To confirm the sensitivities assigned, a review and consolidation of existing literature and datasets was conducted, followed by a site survey. The tasks associated with these components are described below.

3.3. DESKTOP STUDY

The aim of the desktop literature review component was to collate and review available ecological information related to important biodiversity and conservation features in the Project area, including presence of protected areas or important conservation areas, key ecological processes and functions, and the likely composition and structure of local terrestrial biodiversity.

The existing available datasets that were reviewed and consolidated to assess terrestrial ecosystems and associated fauna, flora and vegetation units included:

- A general vegetation type description relevant to the RSA (Regional Study area) which was obtained from Mucina and Rutherford (2011).
- The formal conservation context of the region at a provincial and national level was established based on the National List of Threatened Ecosystems (NEMBA Threatened Ecosystems, 2011), the South African Protected Areas Database (SAPAD), the South African Conservation Areas Database (SACAD) and the national protected area expansion strategy.

As a requirement of the desktop component, a review of existing specialist studies conducted in the RSA was conducted. These studies have been referenced to inform the baseline conditions of the receiving environment.

- Baseline Assessment for the Port of Richards Bay Expansion Programme (Marine and Estuarine Research, 2013)
- Scoping Report for a Strategic Environmental Assessment (SEA) for the Port of Richards Bay (CSIR, 2002).
- Strategic Environmental Assessment (SEA) for the Port of Richards Bay (NEMAI Consulting, 2022)
- Vegetation and Wetland Delineation of Priority Habitats in Transnet Capital Projects Richards Bay Port Expansion Project- (Cruz Environmental, 2024).
- Environmental-and-Resource-Economics (ERE) report (Co-operative Independent Consultants International, 2008).
- Estuaries of Durban, KwaZulu-Natal, South Africa. Report for the Environmental Management Department, eThekweni Municipality (Forbes A.T. & Demetriades N.T, 2010).
- Due Diligence Investigation Expansion of Richards Bay Harbour. Overall Assessment of Estuarine and Freshwater Components. (CRUZ, 2009).
- Port of Richards Bay, Richards Bay Bayside Container Project (RBBCP) studies to be conducted in the Port of Richards Bay, KwaZulu-Natal (Allan, 2009).
- Prioritizing South African estuaries for conservation: a practical example using waterbirds. Biological Conservation 74: 175-185 (Turpie, 1995).
- Status Quo Report: Environmental Management Framework for the Richards Bay Port Expansion Area and Industrial Development Zone. Report produced for the Department of Agriculture, Environmental Affairs and Rural Development. (Thornhill M and van Vuuren D, 2009).
- Due diligence investigation for the acquisition of land for future port development. Gap Analysis (Ilifa Africa Engineers (Pty) Ltd., 2008)

3.4. FIELD SURVEY

Field surveys of the Project area were conducted during the wet season from the 22nd to the 25th of October 2024 and again from the 20th to the 23rd of February 2025. The objectives of these terrestrial biodiversity surveys (inclusive of plant and animal species assessments) were to:

- Confirm the habitat condition of accessible areas mapped as CBA Irreplaceable areas (i.e. natural or transformed.)
- Assess the suitability of the LSA for the support of terrestrial plant, invertebrate, mammal, herpetofauna and avifauna SCC with potential to occur as indicated by the screening tool, to support the site verification and impact assessment.

The methodology applied during the field survey confirm habitat characteristics and plant animal species presence included:

- Traversing the LSA and RSA on foot and by vehicle during the wet season site surveys.
- Documenting the GPS coordinates of SCC fauna and flora encountered.
- Photographing and delineating the different habitat types.
- Visual observation and recording of plant and animal species.
- Camera trapping to record mammal species that may be present.
- Conducting active searches for herpetofauna.
- In accordance with best practice, species identification during field surveys is primarily based on direct visual observation by experienced field personnel. Photographic documentation is provided where feasible, particularly for species that are slow-moving or otherwise amenable to being photographed. However, due to the dynamic and often unpredictable nature of field conditions,

capturing images of all observed species is not always possible. As such, photographs are included as supplementary evidence where available, but are not considered mandatory for species verification

3.5. ASSESSMENT OF SPECIES OF CONSERVATION CONCERN

Flora and mammal species of conservation concern (SCC) were defined as those listed as either Threatened or Near Threatened in regional (i.e., South African / national) Red Lists. Also discussed under SCC are flora and fauna taxa that are listed as Threatened, Protected, or Specially Protected, according to national and/or provincial legislation:

- Red List of South African Plants (SANBI) (redlist.sanbi.org);
- Red List of Mammals of South Africa, Lesotho and Swaziland (Child et al., 2016);
- National Environmental Management: Biodiversity Act (Act No. 10 of 2004) - Threatened or Protected Species List (Notice 389 of 2013) (NEMBA ToPS List, 2007);
- National Forest Act (Act No. 84 of 1998) list of protected trees (Schedule A); and
- Natal Conservation Ordinance (No. 15 of 1974), specifically Schedule 2, 3 and 12 concerning protected and specially protected game and flora species.

3.6. HABITAT SUITABILITY ASSESSMENTS FOR SPECIES OF CONSERVATION CONCERN

Based on the lists of flora and fauna SCC that are known to occur in the region, a 'probability of occurrence' of a particular species being present in the study area was determined by conducting habitat suitability assessments. The following parameters were used in these assessments:

- Habitat requirements: Most threatened species have very specific habitat requirements. The presence of these habitats in the study area was evaluated;
- Habitat status: The status or ecological condition of available habitat was assessed. Often a high level of habitat degradation will negate the potential presence of sensitive species; and
- Habitat linkage: Dispersal and movement between natural areas for breeding and feeding are important population-level processes. Habitat connectivity within the study area and to surrounding natural habitat and corridors was evaluated to determine the likely persistence of SCC.

Probability of occurrence is presented in the following categories:

- Recorded: Any SCC observed/documented in or close to the study area;
- Likely: the species is likely to occur in the study area due to suitable habitat and resources being present;
- Unlikely: the species will not likely occur in the study area due to lack of suitable habitat and resources, or significant differences in its Area of Occupancy (AOO) compared to its Extent of Occurrence (EOO).

3.6.1. ASSESSMENT OF SITE ECOLOGICAL IMPORTANCE (SEI)

The ecological importance of habitat units was determined using the protocol for evaluating site ecological importance (SEI) published in SANBI's Species Assessment Guideline (SANBI, 2020). SEI is considered to be a function of the biodiversity importance (BI) of a receptor and its resilience to impacts (receptor resilience, RR), as per:

SEI = BI + RR.

Biodiversity importance is a function of conservation importance (CI) and the functional integrity (FI) of the receptor, as per:

$$BI = CI + FI$$

- Conservation Importance is defined as “the importance of a site for supporting biodiversity features of conservation concern present, e.g., populations of IUCN threatened and Near Threatened species (CR, EN, VU and NT), Rare species, range-restricted species, globally significant populations of congregatory species, and areas of threatened ecosystem types, through predominantly natural processes” (SANBI, 2020).
- Functional Integrity is defined as “A measure of the ecological condition of the impact receptor as determined by its remaining intact and functional area, its connectivity to other natural areas and the degree of current persistent ecological impacts” (SANBI, 2020).
- Receptor Resilience is defined as “the intrinsic capacity of the receptor to resist major damage from disturbance and/or to recover to its original state with limited or no human intervention” (SANBI, 2020).

Table 3 presents a guideline for interpreting the SEI (SANBI, 2020).

Table 3: Guidelines for interpreting SEI in the context of the proposed development activities

Site Ecological Importance	Interpretation in relation to proposed development activities
Very High	Avoidance mitigation – no destructive development activities should be considered. Offset mitigation not acceptable/not possible (i.e., last remaining populations of species, last remaining good condition patches of ecosystems/unique species assemblages). Destructive impacts for species/ecosystems where persistence target remains.
High	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit amount of habitat impacted; limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.
Medium	Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
Low	Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.
Very Low	Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.
Source: SANBI (2020).	

3.7. IMPACT ASSESSMENT METHODOLOGY

A methodological framework developed by WSP to meet the combined requirements of international best practice and NEMA, Environmental Impact Assessment Regulations, 2014, as amended (GN No. 326) (the “EIA Regulations”) was used to assess identified impacts on terrestrial biodiversity, specifically flora and mammals.

As required by the EIA Regulations (2014) as amended, the determination and assessment of impacts will be based on the following criteria:

- Nature of the Impact;
- Significance of the Impact;
- Consequence of the Impact;
- Extent of the Impact;
- Duration of the Impact;
- Probability if the Impact;
- Degree to which the Impact:
 - can be reversed;
 - may cause irreplaceable loss of resources; and
 - can be avoided, managed or mitigated.
- Following international best practice, additional criteria have been included to determine the significant effects. These include the consideration of the following:
 - Magnitude: to what extent environmental resources are going to be affected;
 - Sensitivity of the resource or receptor (rated as high, medium and low) by considering the importance of the receiving environment (international, national, regional, district and local), rarity of the receiving environment, benefits or services provided by the environmental resources and perception of the resource or receptor); and
 - Severity of the impact, measured by the importance of the consequences of change (high, medium, low, negligible) by considering inter alia magnitude, duration, intensity, likelihood, frequency and reversibility of the change.

It should be noted that the definitions given are for guidance only, and not all the definitions will apply to all of the environmental receptors and resources being assessed. Impact significance was assessed with and without mitigation measures in place.

Impacts are assessed in terms of the following criteria:

1. The nature; a description of what causes the effect, what will be affected and how it will be affected.

Table 4: Nature or type of impact.

Nature of Type of Impact	Definition
Beneficial / Positive	An impact that is considered to represent an improvement on the baseline or introduces a positive change.
Adverse / Negative	An impact that is considered to represent an adverse change from the baseline or introduces a new undesirable factor.
Direct	Impacts that arise directly from activities that form an integral part of the Project (e.g., new infrastructure).
Indirect	Impacts that arise indirectly from activities not explicitly forming part of the Project (e.g., noise changes due to changes in road or rail traffic resulting from the operation of Project).
Secondary	Secondary or induced impacts caused by a change in the Project environment (e.g., employment opportunities created by the supply chain requirements).
Cumulative	Impacts are those impacts arising from the combination of multiple impacts from existing projects, the Project and/or future projects.

2. The physical extent

Table 5: Physical extent rating of impact

Score	Description
1	The impact will be limited to the site;
2	The impact will be limited to the local area;
3	The impact will be limited to the region;
4	The impact will be national; or
5	The impact will be international;

3. The duration, wherein it is indicated whether the lifetime of the impact will be:

Table 6: Duration rating of impact

Score	Description
1	Of a very short duration (0 to 1 years)
2	Of a short duration (2 to 5 years)
3	Medium term (5–15 years)
4	Long term (> 15 years)
5	Permanent (this is considered permanent if the impact will be experienced post mine closure)

4. Reversibility: An impact is either reversible or irreversible. How long before impacts on receptors cease to be evident.

Table 7: Reversibility of impact

Score	Description
1	The impact is immediately reversible.
3	The impact is reversible within 2 years after the cause or stress is removed; or
5	The activity will lead to an impact that is in all practical terms permanent.

5. e) The magnitude of impact on ecological processes, quantified on a scale from 0-10, where a score is assigned.

Table 8: Magnitude rating of impact

Score	Description
0	Small and will have no effect on the environment
1	Minor and will not result in an impact on processes.
2	Low and will cause a slight impact on processes.
3	Moderate and will result in processes continuing but in a modified way.
4	High (processes are altered to the extent that they temporarily cease).

5	Very High and results in complete destruction of patterns and permanent cessation of processes.
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6. f) The probability of occurrence, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale where:

Table 9: Probability rating of impact

Score	Description
1	Very improbable (probably will not happen)
2	Improbable (some possibility, but low likelihood).
3	Probable (distinct possibility).
4	Highly probable (most likely).
5	Definite (impact will occur regardless of any prevention measures).

7. The significance, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high;

- The status, which is described as either positive, negative or neutral;
- The degree to which the impact can be reversed;
- The degree to which the impact may cause irreplaceable loss of resources; and
- The degree to which the impact can be mitigated.

The significance is determined by combining the above criteria in the following formula:

$$\text{Significance} = (\text{Extent} + \text{Duration} + \text{Reversibility} + \text{Magnitude}) \times \text{Probability}$$

$$[S = (E + D + R + M) \times P]$$

Where the symbols are as follows:

Symbol	Criteria
S	Significance Weighting
E	Extent
D	Duration
M	Magnitude
P	Probability

The significance weightings for each potential impact are as follows:

Overall Score	Significance Rating (Negative)	Significance Rating (Positive)	Description
< 30 points	Low	Low	Where this impact would not have a direct influence on the decision to develop in the area
31 - 60 points	Medium	Medium	where the impact could influence the decision to develop in the area unless it is effectively mitigated
> 60 points	High	High	where the impact must have an influence on the decision process to develop in the area

The impact significance without mitigation measures will be assessed with the design controls in place. Impacts without mitigation measures in place are not representative of the proposed development's actual extent of impact and are included to facilitate understanding of how and why mitigation measures were identified. The residual impact is what remains following the application of mitigation and management measures and is thus the final level of impact associated with the development. Residual impacts also serve as the focus of management and monitoring activities during Project implementation to verify that actual impacts are the same as those predicted in this report.

As there are two phases of the proposed development, the assessment will be undertaken for the following stages of the proposed Project:

- Site Establishment / Construction
- Operation

3.7.1. IMPACT MITIGATION

The impact significance without mitigation measures will be assessed with the design controls in place. Impacts without mitigation measures in place are not representative of the proposed development's actual extent of impact and are included to facilitate understanding of how and why mitigation measures were identified. The residual impact is what remains following the application of mitigation and management measures and is thus the final level of impact associated with the development. Residual impacts also serve as the focus of management and monitoring activities during Project implementation to verify that actual impacts are the same as those predicted in this report.

The mitigation measures chosen are based on the mitigation sequence/hierarchy which allows for consideration of five (5) different levels, which include avoid/prevent, minimise, rehabilitate/restore, offset and no-go in that order. The idea is that when project impacts are considered, the first option should be to avoid or prevent the impacts from occurring in the first place if possible, however, this is not always feasible. If this is not attainable, the impacts can be allowed, however they must be minimised as far as possible by considering reducing the footprint of the development for example so

that little damage is encountered. If impacts are unavoidable, the next goal is to rehabilitate or restore the areas impacted back to their original form after project completion. Offsets are then considered if all the other measures described above fail to remedy high/significant residual negative impacts. If no offsets can be achieved on a potential impact, which results in full destruction of any ecosystem for example, the no-go option is considered so that another activity or location is considered in place of the original plan. The mitigation sequence/hierarchy is shown in Figure 3-4 below.

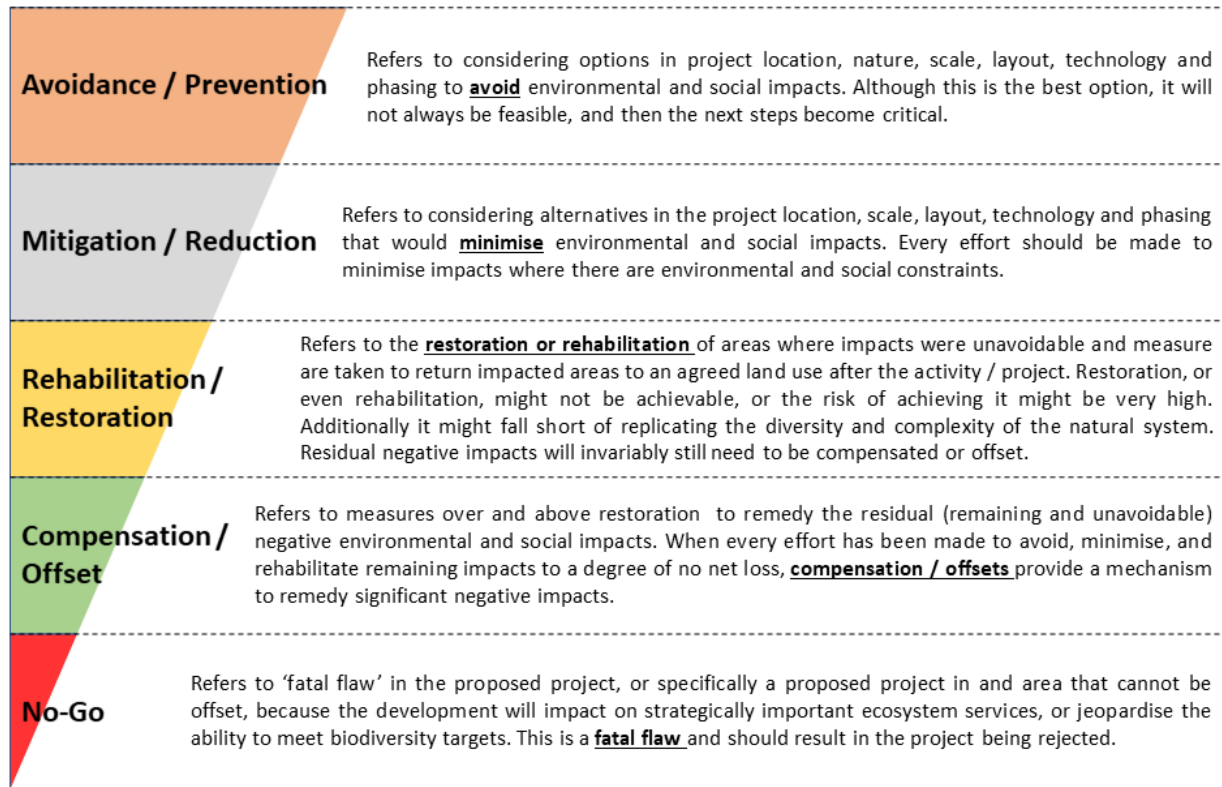


Figure 3-4 - Mitigation Sequence/Hierarchy

4. STUDY ASSUMPTIONS AND LIMITATIONS

- It is possible that certain flora taxa, including inter alia short-lived annuals, geophytes, cryptic species or dormant deciduous species, that are most readily visible or distinguishable when in leaf or flower earlier, or later during the wet/growing season, may have been overlooked during field visit;
- It is possible that rare, cryptic, secretive or transient mammal species may not have been present and/or observed during the field survey. The absence or non-recording of a specific mammal species, at a particular time, does not necessarily indicate that 1) the species does not occur there; 2) the species does not utilise resources in that area; or 3) the area does not play an ecological support role in the ecology of that species; and
- While the need for a dedicated herpetofauna specialist study has been identified—particularly in light of potential and confirmed species of conservation concern—this assessment falls outside the scope of the current report. It is therefore recommended that such a study be undertaken as part of the Biodiversity Offset Plan (BOP) to ensure comprehensive ecological evaluation and informed conservation planning.
- Due to the inherent mobility of birds, it is important to consider avifauna not only on the project site, but also the avifauna occurring within the RSA.

5. TERRESTRIAL BIODIVERSITY BASELINE FINDINGS

5.1. REGIONAL CONTEXT

This section speaks to the regional biodiversity context in the LSA.

Maputaland-Pondoland-Albany Biodiversity

The Project area falls within the Maputaland-Pondoland-Albany Biodiversity hotspot which is recognized as the second richest floristic region in Africa: containing approximately 80% of the of South Africa's remaining forests, rich birdlife and many other significant flora and fauna species. The uMhlathuze Municipal Area supports a total of 170 Red Data species, which has been reported as amongst the highest in the country for an area of its size. This remarkable concentration of Red Data Species is one of the main reasons that the remaining percentage of its surface area under indigenous cover is considered largely irreplaceable by KZN Wildlife for meeting its conservation objectives in the province (uMhlathuze Local Municipality, 2022).

Other Noteworthy Environmental Features

Richards Bay Game Reserve (IBA) occurs 1.48km from the Project area as is a Key Biodiversity Area (KBA) (Figure 5-6) as well as Important Bird Area (IBA) (Figure 5-5) of international significance. These key features are further discussed in the sections that follow.

Mangroves also occur in the LSA. Mangroves in South Africa are among the rarest and most threatened forest types, occurring in 38 estuaries (Ward & Steinke, 1982). Approximately 74% of South Africa's mangrove area is in KwaZulu-Natal (KZN), with significant threats documented since before 1990 (Breen & Hill, 1969; Moll et al., 1971; Begg, 1984; Bruton, 1980). The mangrove forests at Richards Bay, Mlalazi, Durban Bay, Sipingo, and Beachwood are classified as threatened (Moll et al., 1971). The Revised National List of Ecosystems that are Threatened and in Need of Protection,

published in Government Gazette No. 47526, Notice No. 2747 on 18 November 2022, confirms that mangrove ecosystems in KwaZulu-Natal are classified as threatened. Specifically, the gazette lists the KwaZulu Natal Mangrove Forest under the Indian Ocean Coastal Belt biome with a threat status of "Endangered". This classification is based on criteria including habitat loss and degradation over the past decades.

Mangroves provide numerous ecological and economic benefits, including carbon sequestration, protection against cyclones, sediment trapping, and supporting fish and wildlife populations (Kathiresan & Bingham, 2001). Despite efforts at rehabilitation, mangrove coverage in Richards Bay has declined rapidly due to anthropogenic disturbances. The Richards Bay and uMhlathuze Estuaries are crucial for bird diversity and abundance, providing varied habitats for waterbirds. However, bird populations have declined due to port development, pollution, industrial and recreational activities, and habitat loss (Begg, 1978, 1984; Ward & Steinke, 1982).

Critical Biodiversity Area 1 (CBA 1)

Most of the project area falls within a CBA 1: Irreplaceable (Figure 5-1). This aligns with the southern extent of the project area consisting of forested land, grasslands, and estuaries. The northern extent of the project area aligns with built-up sections (Figure 5-2). Development in built-up areas poses minor risk to terrestrial biodiversity receptors, however those occurring in the natural state areas identified can cause substantial harm to the receiving environment.

Vegetation Composition

The RSA (as outlined in section 3.1) consists of a mosaic of regional vegetation types:

- CB 1 Maputaland Coastal Belt: Vulnerable to extinction, with only 15% statutorily conserved. Agriculture is one of the main drivers of transformation of this vegetation type.
- Aza 7 Subtropical Alluvial Vegetation: Least Concern but included in protected areas, which help safeguard the remaining natural habitats.
- FOa 3 Mangrove Forests: Critically endangered; and
- FOa 2 Swamp Forest: Critically Endangered.

The LSA and project footprint however only directly overlaps with only the Aza 7 Subtropical Alluvial Vegetation type, according to desktop assessment.

Previous land-use

The Berth605 Project area was completely dredged previously. Due to strict access protocol and tropical conditions present in the LSA, natural succession rapidly ensued, leading to the presence of healthy ecosystem functionality present.

5.1.1. TERRESTRIAL CRITICAL BIODIVERSITY AREAS

The Project area was compared to relevant available spatial biodiversity planning datasets, i.e. the uMhlathuze Local Municipality Integrated Development Plan (2022) (IDP) and KZN Biodiversity Sector Plan (2016) to assess the local and regional biodiversity context of the Project area.

The KZN Biodiversity Sector Plan outlines the following as critical for conservation targets:

- **Critical Biodiversity Areas (CBAs):** These are areas that are crucial for conserving biodiversity and maintaining ecosystem functioning. They include habitats for threatened species and ecosystems that are not well-represented in protected areas.

- **Ecological Support Areas (ESAs):** These areas are essential for supporting the ecological functioning of CBAs. They help maintain ecological processes and provide connectivity between different habitats.
- **Other Natural Areas (ONAs):** These are areas that are not classified as CBAs or ESAs but still contain natural habitats that contribute to overall biodiversity and ecosystem health.
- **Protected Areas (PAs):** These are legally designated areas managed for long-term conservation of nature, including national parks, nature reserves, and other conservation areas.

In addition, the uMhlathuze Local Municipality's IDP outlines the following as critical for conservation targets:

Nature Reserves (Level 1):

- Areas of high biodiversity and environmental significance that require a high level of legal protection. Included are unique habitats or areas that are considered important at International, National or Provincial level; estuaries, lakes, major wetlands, natural forests, coastal buffers and critically endangered habitats that are protected in terms of international or national legislation and/or treaties. It is recommended that these areas be proclaimed as nature reserves in terms of relevant legislation such as the National Environmental Management Protected Areas Act.

Conservation Zone (Level 2):

- Areas of biodiversity / environmental significance, which are not viable for proclamation as nature reserves, but that require some form of legal protection. Included are unique or regionally important natural habitats; wetland and forest areas that are protected in terms of national legislation; and all areas that fall within the 1:100-year flood line. No transformation of the natural assets or the development of land for purposes other than conservation should be permitted in this zone. Sustainable use of renewable resources is permitted.

Open Space Linkage Zone (Level 3):

- Areas that provide a natural buffer for Level 1 and 2 Zones, areas that provide a natural link between Level 1 and 2 Zones and areas that supply, or ensure the supply of, significant environmental services. Transformation of natural assets and the development of land in these zones should only be permitted under controlled conditions.

Development Zone (Level 4):

- Areas that are not included in Level 1, 2 and 3 zones. Areas in this zone are either already developed or transformed and contain land and natural assets that are not critical for environmental service supply. However, it is recognized that the development of these zones can impact on environmental services supply. As such, they should be developed in a manner that supports, or at least does not adversely impact on, the sustainability of environmental service supply in Level 1, 2 and 3 zones.

The LSA is located within a CBA 1: Irreplaceable (Figure 5-1) in accordance with the KZN Biodiversity Sector Plan (2016). CBAs are areas of high biodiversity value which are at risk of being lost and identified as important in meeting provincial and national biodiversity targets. These areas align with wetlands, forested land and grasslands as presented in the national landcover dataset (GTI, 2020) (Figure 5-2).

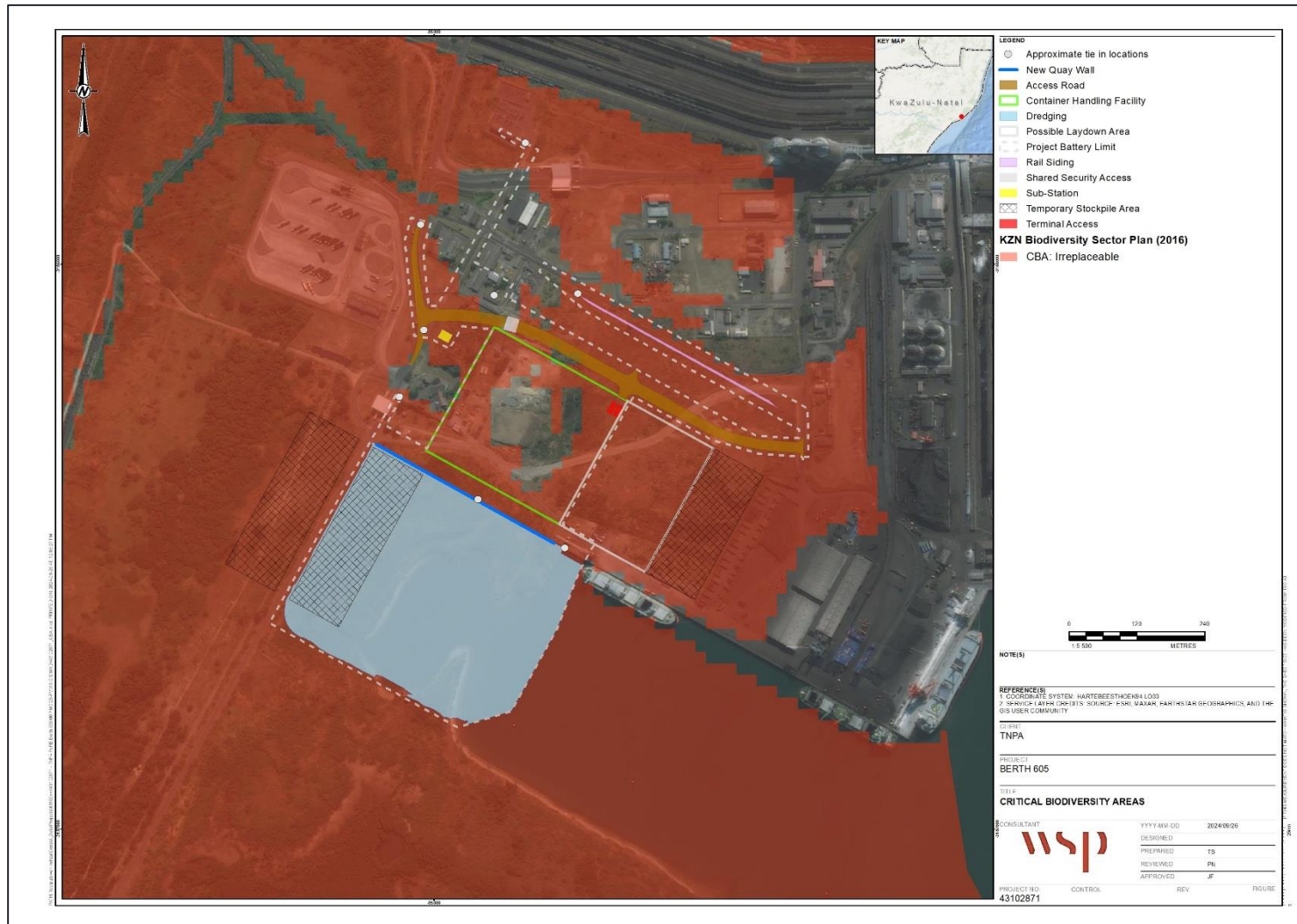


Figure 5-1 - Project area in relation to National Biodiversity Sector Plan (2016)

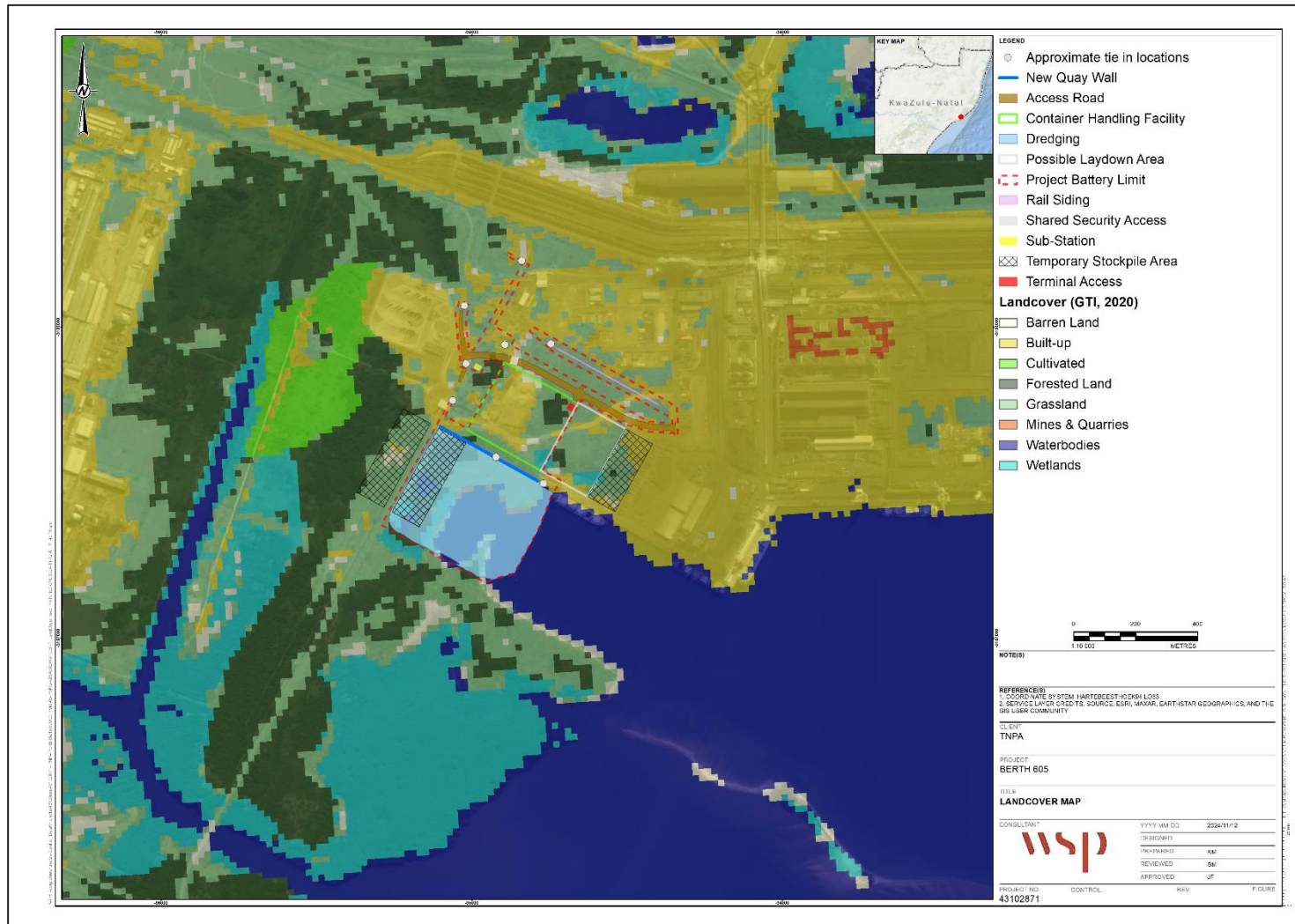


Figure 5-2 - Landcover dataset for the project area (GTI,2020)

5.1.2. PRIORITY AREAS FOR PROTECTED AREA EXPANSION

The entirety of the LSA coincides with Priority Focus Areas as part of the National Protected Area Expansion Strategy (2018) (Figure 5-3). The Richard Bay Game Reserve is listed on the National Protected Areas Register (DFFE, 2022) and is located approximately 1.48 km South of the project area (Figure 5-4).

5.1.3. PROTECTED ECOSYSTEMS

The National Forests Act (No 84 of 1998) controls the management of forestry in the country and aims to promote the sustainable utilisation of forests for environmental, economic, and educational purposes. Mangroves are classified as natural forests and as such a licence is required for the removal or harvesting of trees. *Bruguiera gymnorhiza* and *Rhizophora mucronata* are further protected under the Protected Tree List (DWAF, 2010). Mangrove forests and associated biota are also protected under the Marine Living Resource Act (18 of 1998) which aims to sustainably utilise any marine resource, preserve marine biodiversity and to conserve marine living resources for future generations. Protection was also given to all estuaries that contained >5 ha of mangrove habitats in the South African National Estuary Conservation Plan (Turpie et al. 2010).

5.1.4. IMPORTANT BIRD AREAS

Richards Bay Game Reserve is an IBA that occurs 1.48 km South of the LSA (Figure 5-5). It holds more than 10 000 waterbirds. The wetland supports a complex community of water-associated birds that is seldom dominated by any species. The abundances of distinct species vary considerably as water levels and other conditions shift. The avifauna is diverse, largely because of the mosaic nature of the marginal vegetation along the water's edge, and the fact that several species reach the most southerly limit of their Afro-tropical distribution here (Birdlife International, 2024). The following avian species trigger the assessment.

- Regionally threatened species are Pink-backed Pelican (*Pelecanus rufescens*)-Vulnerable.
- Caspian Tern (*Sterna caspia*)-Vulnerable.
- Mangrove Kingfisher (*Halcyon senegaloides*)-Endangered.
- Great White Pelican (*Pelecanus onocrotalus*)- Vulnerable.
- Greater Flamingo (*Phoenicopterus roseus*)-Vulnerable.
- Little Tern (*Sterna albifrons*)-Least Concern; and
- Whiskered Tern (*Chlidonias hybrida*)-Least Concern.

5.1.5. KEY BIODIVERSITY AREA'S (KBA)

KBAs are 'sites that contribute significantly to the global persistence of biodiversity,' which means they are the most important places in the world for species and their habitats – whether these be in terrestrial, freshwater, estuarine or marine ecosystem (SANBI, 2024).

The Global Standard for the Identification of KBAs, published in 2016, sets out internationally agreed scientific criteria for the identification of KBAs worldwide. Sites qualify as global KBAs if they meet the specific standardised criteria and quantitative thresholds focused on one or more of five trigger aspects:

- Threatened biodiversity.
- Geographically restricted biodiversity.
- Ecological integrity.

- Biological processes; and
- Irreplaceability through quantitative analysis.

The entirety of the LSA occurs within a KBA (Figure 5-6) namely 'Richards Bay Coast (100896).'

Richards Bay Coast is a terrestrial site found in KZN, South Africa. The site includes a large estuarine lake ecosystem, industrial port, and other smaller predominantly open estuaries to the south. The shore component of the site is mostly sandy. There are species-rich, tall/medium-height subtropical coastal forests occurring on stabilised coastal dunes. These forests have well-developed tree, shrub, and herb layers. *Mimusops caffra*, *Sideroxylon inerme*, *Dovyalis longispina*, *Acacia kosiensis* and *Psydrax obovata subsp. obovata* are the most common constituents of the tree layer. Herbaceous vines and woody climbers are important structural determinants in these forests. Includes a flat coastal plain originally densely forested in places with a wide range of interspersed no forest plant communities including dry grasslands (which include palm veld where special conditions prevail), *hygrophilous* grasslands and thicket groups.

The Global Standard for the Identification of KBAs is a framework developed by the International Union for Conservation of Nature (IUCN) to identify sites that are critical for the global persistence of biodiversity

- Criterion A1: Sites that hold significant numbers of one or more globally threatened species.
- Criterion B1: Sites that hold a significant proportion of the global population of one or more species.
- Criterion B2: Sites that support an assemblage of co-occurring range-restricted species.
- Criterion E: Sites that are irreplaceable for the global persistence of species based on quantitative analysis.
- Criterion B4: Sites that hold significant proportions of the global extent of geographically restricted ecosystems

This study area qualifies as a Key Biodiversity Area of **international** significance that meets the thresholds for 3 criteria described in the Global Standard for the Identification of KBAs.

Five species meet one or more KBA criteria, inclusive of amphibians, fish, and plants. The LSA meets criterion A1 due to the presence of significant proportions of the global populations of 4 threatened species. The project area regularly holds 1 individual geographically restricted species, therefore meeting criterion B1. An assemblage of co-occurring range-restricted species in the Amphibia taxonomic group regularly present within the site meets criterion B2. A quantitative analysis of irreplaceability indicates that the site is 100% irreplaceable for the global persistence of 2 species, therefore meeting criterion E. The site holds significant proportions of the global extent of 2 geographically restricted ecosystems (meeting criterion B4) (IUCN, 2024).

The following terrestrial species trigger the KBA criteria:

- Forest thread snake (*Leptotyphlops sylvicolus*)- Least Concern.
- Spotted snout-burrower (*Hemisus guttatus*)- Near Threatened; and
- Pickersgill's reed frog (*Hyperolius pickersgilli*)- Endangered.



Figure 5-3 - Project area in relation to National Protected Area Expansion Strategy (2018)

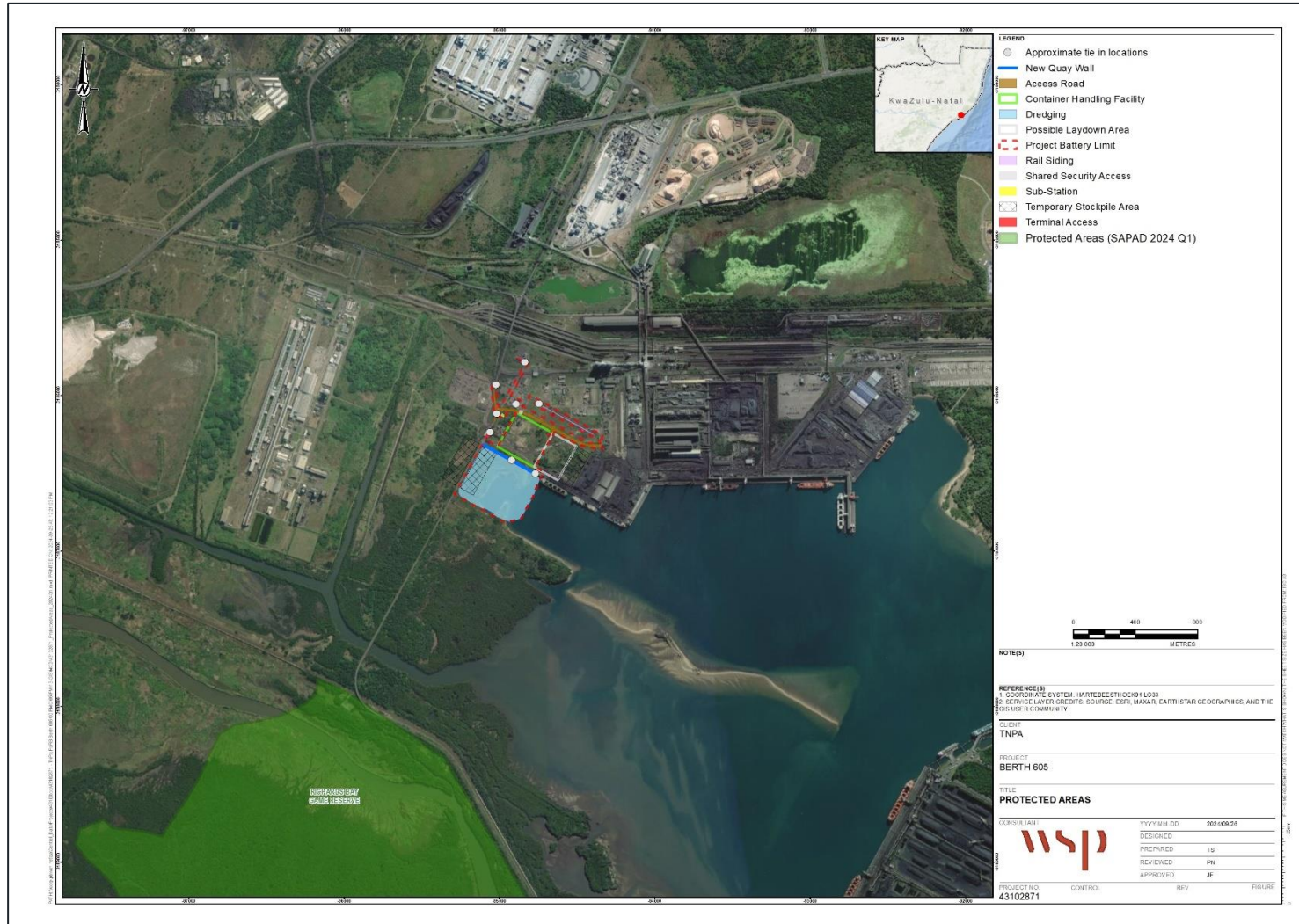


Figure 5-4 - Project area in relation to South African Protected Area Database (2023)



Figure 5-6 - Project area in relation to Key Biodiversity Areas (KBA's) (SANBI,2024)

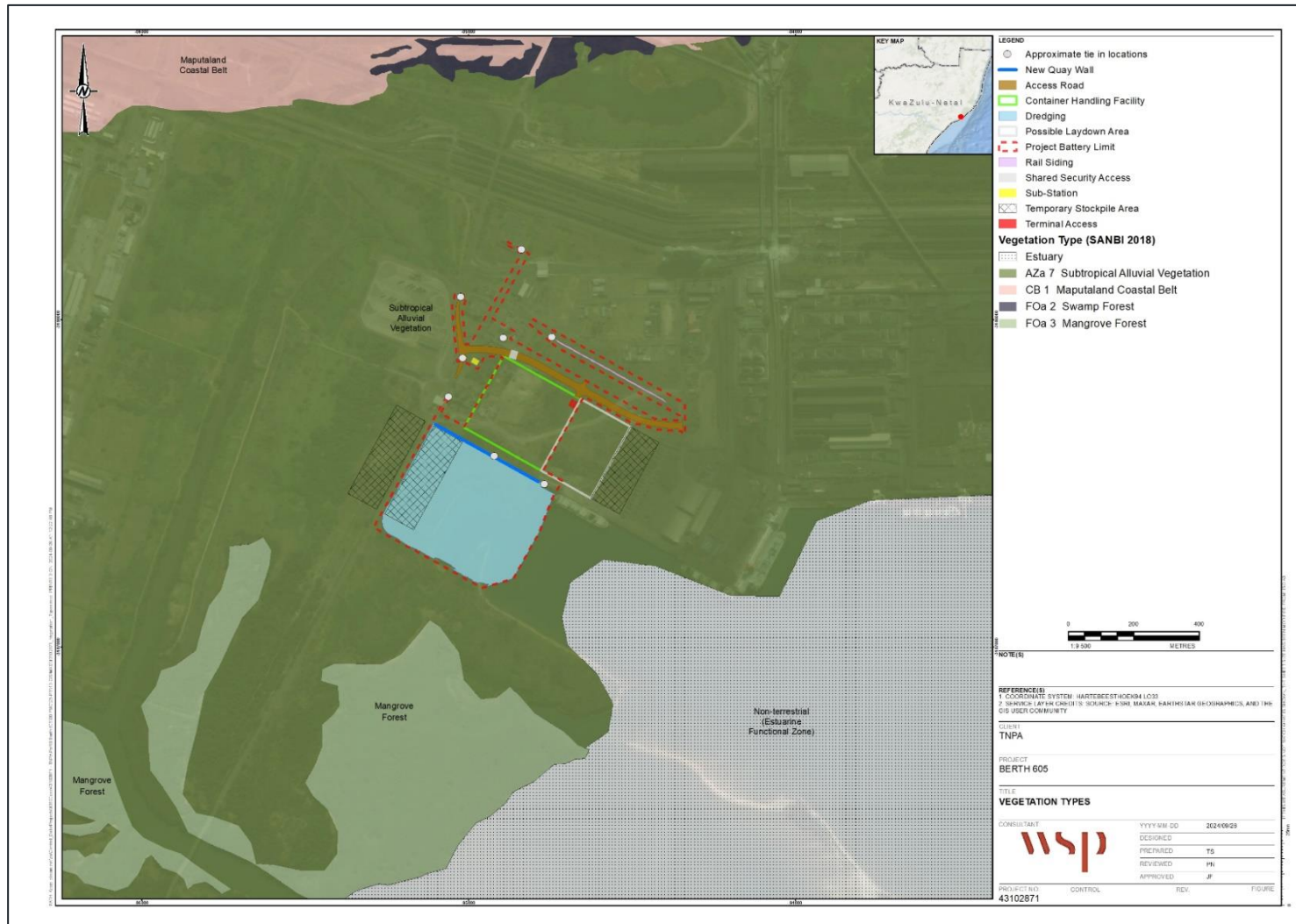


Figure 5-7 - Project area in relation to National Vegetation Types



Figure 5-8 - Project area in relation to National Threatened Ecosystems



5.2. FIELD SURVEY FINDINGS

This section represents the findings of the wet season field surveys conducted from the 22nd to the 25th of October 2024 and 20th to the 23rd of February 2025.

5.2.1. HABITAT MAPPING AND ASSESSMENT

Five main habitat units have been delineated in the LSA (Figure 5-9). These habitats range from completely transformed with a low SEI (Site Ecological Importance) to ecologically healthy with a very high SEI.

1. Completely Transformed Area (Very Low SEI).
2. Secondary Grasslands and Woodlands (Low SEI).
3. Moist Grasslands (Medium SEI).
4. Coastal Forest (High SEI).
5. *Bruguiera gymnorhiza* mangrove forests (Very High).

Associated plant and animal species that were recorded in this study, supplemented by the findings of previous specialist studies conducted in the LSA as well as further information about each habitat unit and current ecological importance is represented in Table 5-1Table 5-.

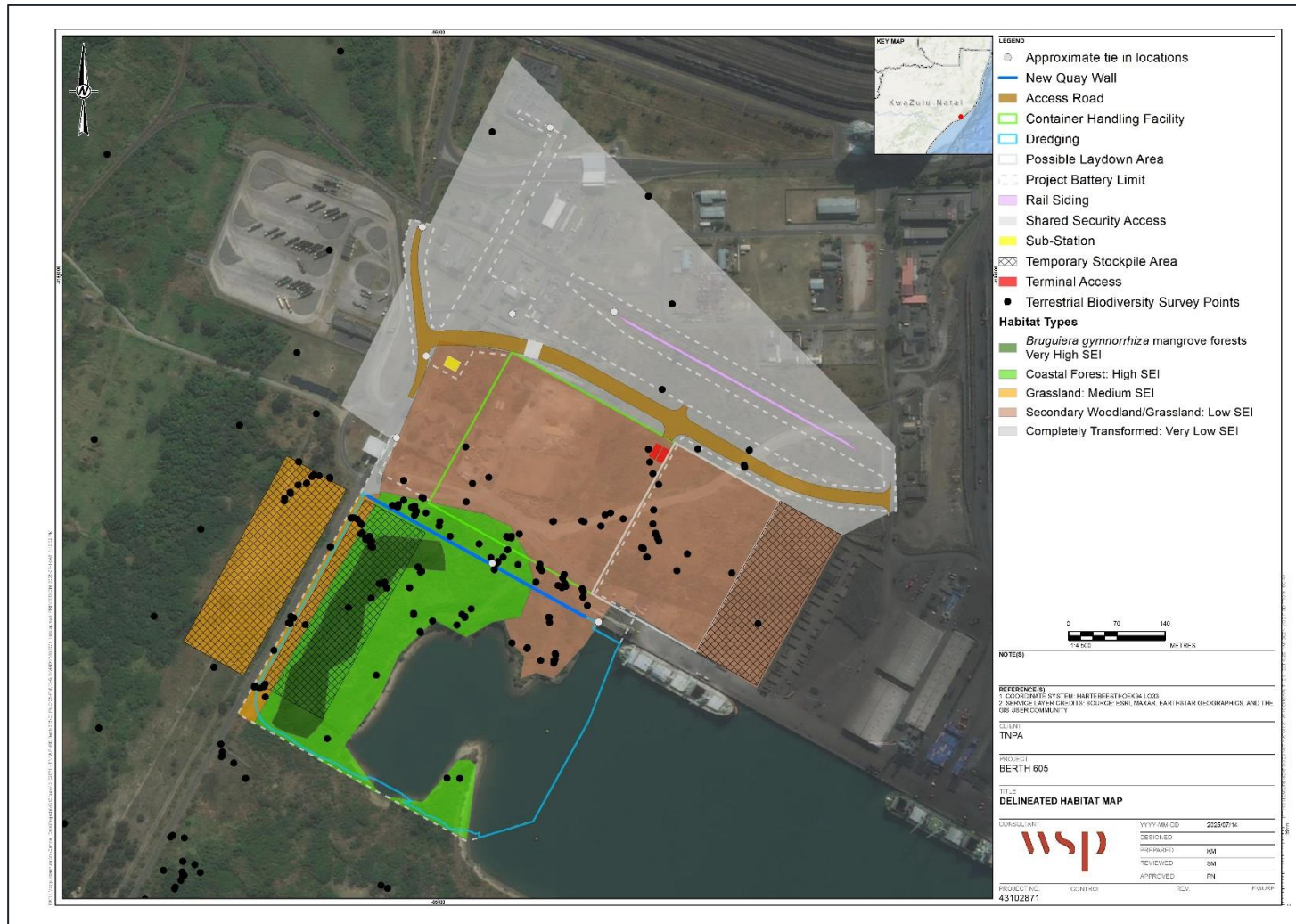


Figure 5-9 – Habitat units in the project area, their associated SEI (Site Ecological Importance) and field observation points

Table 5-1 – Habitats identified and mapped within the LSA, associated SEI and anticipated flora and fauna SCC associations.

Habitat Unit	Description and SEI	Expected SCC
<p>1- Completely Transformed Area (28°47'12.59"S, 32°1'46.55"E)</p> 	<p>Previously disturbed areas in the LSA, with little/no ecological value. Incapable of providing suitable habitat for any SCC.</p> <p>SEI: VERY LOW</p>	<p>None.</p>

Habitat Unit	Description and SEI	Expected SCC
<p data-bbox="163 316 723 347">2- Secondary Woodlands and Grasslands</p> <p data-bbox="118 384 851 507">There is a habitat gradient present in this unit, with woodlands occurring south-east (28°47'26.19"S, 32° 1'50.57"E) and grasslands occurring north-west (28°47'19.92"S, 32° 1'44.25"E).</p> 	<p data-bbox="891 316 1453 403">A substantial proportion has already been transformed following historical disturbance or previous transformation.</p> <p data-bbox="891 440 1453 595">Remanent woodland habitat includes <i>Vachellia kosiensis</i> secondary woodlands, <i>Cassuarina equisetifolia</i> secondary woodlands and Sub-community <i>Lantana camara</i>–<i>Schinus terebinthifolius</i> secondary shrublands.</p> <p data-bbox="891 632 1453 786">Remanent grassland habitat includes <i>Schinus terebinthifolius</i>, <i>Washingtonia robusta</i>, <i>Chromolaena odorata</i>, <i>Casuarina equisetifolia</i>, and artificial changes in the drainage of the landscape.</p> <p data-bbox="891 887 1059 919">SEI: MEDIUM</p>	<p data-bbox="1476 316 1615 347">Plant SCC</p> <ul data-bbox="1476 363 2148 611" style="list-style-type: none"> ■ <i>Dioscorea sylvatica</i> – Can persist in disturbed forest margins and secondary woodland. ■ <i>Bonatea lamprophylla</i> – Found in grasslands and forest edges; moderately disturbance-tolerant. ■ <i>Mimusops caffra</i> – Coastal forest species that can survive in secondary thickets and disturbed areas. ■ <i>Sideroxylon inerme</i> – Hardy species; often found in degraded coastal forest and woodland edges. <p data-bbox="1476 639 1653 671">Mammal SCC</p> <ul data-bbox="1476 671 2148 1070" style="list-style-type: none"> ■ Blue Duiker – Can adapt to secondary forests and thickets. ■ Red Duiker – Shows some tolerance to fragmented and secondary forest habitats. ■ Common Dasymys – Found in moist grasslands and tolerant of agricultural and disturbed wetland edges. ■ Least Dwarf Shrew – Occurs in grassy and shrubby areas, including disturbed zones. ■ African Clawless Otter – Uses human-modified wetlands and riverbanks. ■ Anchieta's Pipistrelle, Light-winged Lesser House Bat, Butterfly Bat – Roost in buildings and forage in disturbed woodland and grassland mosaics. <p data-bbox="1476 1102 1715 1134">Herpetofauna SCC</p> <ul data-bbox="1476 1134 2148 1350" style="list-style-type: none"> ■ Spotted Shovel-nosed Frog – Found in disturbed grasslands and temporary wetlands. ■ Pickersgill's Reed Frog – Occurs in degraded coastal grasslands and reedbeds. ■ Large-scaled Grass Lizard – Prefers open grasslands and tolerates grazing and light disturbance.

Habitat Unit	Description and SEI	Expected SCC
		Avifauna SCC <ul style="list-style-type: none"> ■ Southern Banded Snake Eagle – Hunts in secondary woodland and forest edges. ■ Spotted Ground Thrush – Can use regenerating forest patches and disturbed undergrowth.
<p>3- Moist Grasslands (28°47'24.58"S, 32° 1'28.21"E)</p> 	<p>There is limited anthropogenic disturbance in this habitat unit. Wetland and grassland ecosystem functioning still occurs. Faunal and floral species are present. In addition, the area provides habitat connectivity and ecosystem corridors.</p> <p>Moist grasslands in South Africa are typically found in high-altitude or coastal lowland regions with moderate to high rainfall, supporting a rich diversity of grasses, forbs, and geophytes</p> <p>These ecosystems are characterized by deep, fertile soils, seasonal waterlogging, and a dense herbaceous layer dominated by C4 grasses. Moist grasslands often occur in valley bottoms, floodplains, and gentle slopes, where water retention is higher, and are interspersed with wetlands, seeps, and occasional woody vegetation. They provide critical habitat for a range of specialist fauna, including amphibians, small mammals, and grassland-dependent birds.</p> <p>SEI: MEDIUM</p>	Herpetofauna SCC <ul style="list-style-type: none"> ■ Gaboon Adder (<i>Bitis gabonica</i>) – Prefers moist, forested grasslands and thickets; known from northern KwaZulu-Natal. ■ Spotted Shovel-nosed Frog (<i>Hemissus guttatus</i>) – Associated with moist grasslands and wetlands; often found in interdune depressions. ■ Pickersgill's Reed Frog (<i>Hyperolius pickersgilli</i>) – Critically Endangered; endemic to coastal moist grasslands and reed beds in KwaZulu-Natal. Avifauna SCC <ul style="list-style-type: none"> ■ Southern Banded Snake Eagle (<i>Circaetus fasciolatus</i>) – Utilizes Forest edges and moist grasslands for hunting. ■ Spotted Ground Thrush (<i>Geokichla guttata</i>) – Prefers dense, moist forest undergrowth and adjacent grasslands; vulnerable due to habitat fragmentation. Plant SCC <ul style="list-style-type: none"> ■ <i>Dioscorea sylvatica</i> – Occurs in moist forest margins and grasslands; vulnerable due to harvesting and habitat loss. ■ <i>Bonatea lamprophylla</i> – Found in moist grasslands and forest margins; rare and localized. ■ <i>Ficus trichopoda</i> – Associated with swamp forests and moist lowland areas.



Habitat Unit	Description and SEI	Expected SCC
		<ul style="list-style-type: none">▪ <i>Barringtonia racemosa</i> – Found in swampy areas and estuarine margins; overlaps with moist grassland ecotones.▪ <i>Bruguiera gymnorhiza</i> – Mangrove species, but may occur near moist grassland-estuarine transitions.▪ <i>Avicennia marina</i> – Similar to <i>Bruguiera</i>; overlaps with estuarine moist zones.

Habitat Unit	Description and SEI	Expected SCC
<p>4- <i>Bruguiera gymnorhiza</i> mangrove forests (28°47'28.39"S, 32° 1'31.93"E)</p> 	<p><i>Bruguiera gymnorhiza</i> is a mangrove species found in the intertidal zones of estuaries and sheltered coastal areas throughout tropical and subtropical regions. It typically occupies the landward margins of mangrove forests, where tidal inundation is less frequent but soils remain brackish, muddy, and oxygen poor.</p> <p>This species thrives in fine alluvial sediments, often forming dense stands along estuarine banks and creek edges. It is adapted to daily tidal flooding, and its knee roots (a form of aerial root) facilitate gas exchange in anaerobic soils while stabilizing the substrate. <i>Bruguiera gymnorhiza</i> is often found in association with other mangrove species such as <i>Rhizophora mucronata</i> and <i>Avicennia marina</i>, contributing to the structural complexity and ecological resilience of mangrove ecosystems.</p> <p>Its tolerance to salinity and sedimentation makes it a key species in coastal protection, carbon sequestration, and nursery habitat provision for estuarine fauna.</p> <p>SEI: VERY HIGH</p>	<p>Plant SCC</p> <ul style="list-style-type: none"> ■ <i>Bruguiera gymnorhiza</i> (<i>Black Mangrove</i>) – Core mangrove species; thrives in intertidal mudflats and estuarine zones ■ <i>Avicennia marina</i> (<i>White Mangrove</i>) – Found in seaward mangrove zones; tolerant of salinity and tidal fluctuations. ■ <i>Rhizophora mucronata</i> (<i>Red Mangrove</i>) – Common in sheltered estuarine areas; forms dense mangrove stands. ■ <i>Barringtonia racemosa</i> – Occurs in swamp forests and estuarine margins; transitional between mangrove and freshwater systems. ■ <i>Ficus trichopoda</i> – Found in swampy, estuarine environments; overlaps with mangrove ecotones. ■ <i>Zostera capensis</i> (<i>Cape Eelgrass</i>) – Found in shallow estuarine waters near mangrove zones; recorded (28° 47' 31.39" S, 32° 01' 29.99") <p>Mammal SCC</p> <ul style="list-style-type: none"> ■ African Clawless Otter – Uses mangrove creeks and estuarine channels for foraging. ■ Common Hippopotamus – May utilize estuarine floodplains adjacent to mangroves. ■ Sundevall's Leaf-nosed Bat, Geoffroy's Horseshoe Bat, Schreibers's Long-fingered Bat, Butterfly Bat – Roost in forested areas near mangroves; forage over wetlands. ■ Swynnerton's Horseshoe Bat, Anchieta's Pipistrelle, Light-winged Lesser House Bat – Likely to use mangrove-adjacent habitats for roosting and feeding.

Habitat Unit	Description and SEI	Expected SCC
		<p>Herpetofauna SCC</p> <ul style="list-style-type: none"> Green Mamba – Found in coastal forests and mangrove edges. Gaboon Adder – May occur in swamp forests adjacent to mangroves. Pickersgill's Reed Frog – Critically Endangered; known from estuarine reed beds and moist coastal grasslands near mangroves. <p>Avifauna SCC</p> <ul style="list-style-type: none"> Mangrove Kingfisher – Endangered; strictly confined to mangrove habitats in KwaZulu-Natal. African Finfoot – Prefers slow-moving water in mangrove creeks and estuarine channels. Caspian Tern, Pink-backed Pelican, Great White Pelican – Use mangrove estuaries for feeding and roosting. Southern Banded Snake Eagle – Hunts in mangrove and swamp forest areas. Yellow-billed Stork, Saddle-billed Stork, African Pygmy Goose, Lesser Jacana – Frequent mangrove wetlands and adjacent floodplains.
5- Coastal Forest (28°47'30.57"S 32°, 1'33.00"E)	South Africa's coastal forests are found along the eastern seaboard, primarily in KwaZulu-Natal and the Eastern Cape, where warm, moist climatic conditions support a rich diversity of evergreen and semi-deciduous tree species. These forests typically occur on dune systems, low-lying coastal plains, and riverine floodplains, often forming part of a mosaic with mangroves, swamp forests, and grasslands. The vegetation is structurally complex, with a closed canopy, dense understorey, and high	<p>Plant SCC</p> <ul style="list-style-type: none"> <i>Adenia gummifera var. gummifera</i> – Found in forest margins and coastal thickets. <i>Dioscorea sylvatica</i> – Occurs in forested areas and moist forest margins. <i>Bonatea lamprophylla</i> – Grows in forest margins and moist grasslands. <i>Ficus trichopoda</i> – Found in swamp forests and estuarine forest zones. <i>Barringtonia racemosa</i> – Occurs in swamp forests and estuarine margins.



species richness, including many endemics and species of conservation concern.

Coastal forests provide critical habitat for forest-dependent fauna, including primates, small antelope, forest birds, and a variety of invertebrates. They are also important for ecosystem services such as carbon storage, erosion control, and water regulation.

Despite their ecological importance, coastal forests are highly vulnerable to urban expansion, agriculture, and invasive species, with significant portions already lost or fragmented. Restoration and protection efforts are essential to maintain their biodiversity and ecological function.

SEI: VERY HIGH

- *Mimusops caffra* – Coastal forest and dune thicket species.
- *Sideroxylon inerme* – Common in coastal forests and dune vegetation.

Mammal SCC

- Samango Monkey – Forest-dependent; found in coastal and montane forests.
- Red Duiker – Prefers dense coastal and swamp forests.
- Blue Duiker – Inhabits coastal and lowland forests.
- Swinny's Horseshoe Bat, Anchieta's Pipistrelle, Schreibers's Long-fingered Bat, Light-winged Lesser House Bat, Geoffroy's Horseshoe Bat, Sundevall's Leaf-nosed Bat – Roost in forested areas, including coastal forests.
- Sclater's Mouse Shrew, Common Dasymys, Least Dwarf Shrew – Found in moist forest undergrowth and swampy forest margins.
- Butterfly Bat – Forages over forested wetlands.
- African Clawless Otter – Uses forested riverbanks and estuarine forest edges.

Herpetofauna SCC

- Gaboon Adder – Found in dense forest and swamp forest habitats.
- Green Mamba – Prefers coastal forests and thickets.
- Serato's Dwarf Chameleon – Inhabits forested coastal areas.
- Pickersgill's Reed Frog – Occurs in moist coastal grasslands and reed beds near forest margins.

Avifauna SCC

- Spotted Ground Thrush – Vulnerable; prefers dense coastal forest undergrowth.
- Southern Banded Snake Eagle – Hunts in forested areas and forest edges.



Habitat Unit	Description and SEI	Expected SCC
		<ul style="list-style-type: none">▪ Mangrove Kingfisher – Uses coastal forest and mangrove habitats.▪ Crowned Eagle – Found in large tracts of coastal and montane forest.▪ African Finfoot – Frequents forested riverbanks and estuarine channels.▪ Tawny Eagle, Yellow-billed Stork, Pink-backed Pelican, Great White Pelican, Caspian Tern, African Pygmy Goose, Lesser Jacana, Saddle-billed Stork – While not strictly forest-dependent, many use adjacent forested wetlands and estuarine zones.

5.2.2. FLORA

5.2.2.1. Vegetation Types

The RSA (as defined in Section 3.1) consists of a mosaic of regional vegetation types:

- CB 1 Maputaland Coastal Belt: Vulnerable to extinction, with only 15% statutorily conserved. Agriculture is one of the main drivers of transformation of this vegetation type.
- Aza 7 Subtropical Alluvial Vegetation: Least Concern but included in protected areas, which help safeguard the remaining natural habitats.
- FOa 3 Mangrove Forests: Critically endangered; and
- FOa 2 Swamp Forest: Critically Endangered.

However, the LSA only directly overlaps with Least Concern Aza 7 Subtropical Alluvial Vegetation (Figure 5-7).

5.2.2.2. Plant Species

The site survey confirmed that two declining plant species are present, and eight protected tree species and two declining species were flagged as likely to occur in the LSA, based on habitat suitability and their known species distributions. The list of all confirmed plant species, as well as the likelihood of occurrence of additional SCC plants is detailed in Table 5-2.

Cape Eelgrass (*Zostera capensis*) was recorded in the LSA during previous studies. Further information regarding this species and its occurrence is addressed in the Estuarine Ecology specialist study (Allan, 2024).

Table 5-2 – Plant species present in the LSA.

Occurrence	Scientific Name	Common Name	National Red-List
Present	<i>Genus Commelina</i>	Dayflowers	Least Concern
Present	<i>Microsorium scolopendria</i>	Monarch Fern	Least Concern
Present	<i>Carpobrotus dimidiatus</i>	Eastern Sourfig	Least Concern
Present	<i>Salicornia natalensis</i>	Common Glasswort	Least Concern
Present	<i>Vachellia kosiensis</i>	Kosie Thorn	Least Concern
Present	<i>Apodytes dimidiata</i>	White Pear	Least Concern
Present	<i>Brachylaena discolor</i>	Coast Silver-Oak	Least Concern
Present	<i>Bridelia micrantha</i>	Coastal Goldenleaf	Least Concern
Present	<i>Casuarina equisetifolia</i>	Beach Sheoak	Least Concern
Present	<i>Chrysanthemoides monilifera</i>	Chryanthemum necklace	Least Concern
Present	<i>Clerodendrum glabrum</i>	Cat's-Whiskers	Least Concern
Present	<i>Ficus natalensis</i>	Common Wild Fig	Least Concern
Present	<i>Bridelia micrantha</i>	Coastal Golden Leaf	Least Concern
Present	<i>Hibiscus tiliaceus</i>	Sea Hibiscus	Least Concern
Present	<i>Rhoicissus digitata</i>	Baboon Grape	Least Concern
Present	<i>Searsia nebulosa</i>	Coasta Curranthus	Least Concern

Present	<i>Tecoma stans</i>	Yellow Trumpet Flower	Least Concern
Present	<i>Trema orientalis</i>	Oriental Trema	Least Concern
Present	<i>Gomphocarpus physocarpus</i>	Balloonplant	Least Concern
Present	<i>Gymnosporia senegalensis</i>	confetti spikethorn	Least Concern
Present	<i>Jasminum multipartitum</i>	starry wild jasmine	Least Concern
Present	<i>Vachellia kosiensis</i>	broadpod robust thorn	Least Concern
Present	<i>Cyclosorus interruptus</i>	Marsh Fern	Least Concern
Present	<i>Imperata cylindrica</i>	Bedding grass	Least Concern
Present	<i>Scutia myrtina</i>	heath phylica	Least Concern
Present	<i>Strelitzia nicolai</i>	Natal Wild Banana	Least Concern
Present	<i>Achrostichum aureum</i>	Golden Leather fern	Least Concern
Present	<i>Vepris lanceolata</i>	white ironwood	Least Concern
Present	<i>Abrus precatorius</i>	Bead vine	Least Concern
Present	<i>Passiflora subpeltata</i>	White Passionflower	Least Concern
Present	<i>Sesbania sesban</i>	Egyptian Riverhemp	Least Concern
Present	<i>Asparagus multiflorus</i>	Manyflower Asparagus	Least Concern
Present	<i>Catharanthus roseus</i>	Madagascar Periwinkle	Least Concern
Present	<i>Cheilanthes viridis</i>	Green Cliff Brake	Least Concern
Present	<i>Sarcostemma viminalis</i>	Caustic Vine	Least Concern
Present	<i>Panicum maximum</i>	Guinea Grass	Least Concern
Present	<i>Chrysanthemoides monilifera</i>	Bush tick-berry	Least Concern
Present	<i>Canavalia rosea</i>	Bay Bean	Least Concern
Present	<i>Carpobrotus dimidiatus</i>	Eastern Sourfig	Least Concern
Present	<i>Adenia gummiifera</i> var. <i>gummiifera</i>	-	Declining
Present	<i>Adenia gummiifera</i>	Monkey Rope	Declining
Present	<i>Ficus trichopoda</i>	Swamp fig	Protected Tree
Present	<i>Barringtonia racemosa</i>	Powder-puff tree	Protected Tree
Present	<i>Bruguiera gymnorrhiza</i>	Black mangrove	Protected Tree
Present	<i>Mimusops caffra</i>	Coastal red milkwood	Protected Tree

Present	<i>Rhizophora mucronata</i>	Red mangrove	Protected Tree
Present	<i>Sideroxylon inerme</i>	White milkwood	Protected Tree
<i>Present</i>	<i>Avicennia marina</i>	Grey Mangrove	Protected Tree
<i>Present</i>	<i>Bruguiera gymnorhiza</i>	Orange Mangrove	Protected Tree
Likely. Ideal habitat conditions present.	<i>Bonatea lamprophylla</i>	Green wood orchid	Vulnerable
Likely. Ideal habitat conditions present.	<i>Dioscorea sylvatica</i>	Forest elephant's foot	Vulnerable
Present in RSA.	<i>Zostera capensis</i>	Cape Eelgrass	Vulnerable

Transformed areas are present and have been delineated within the LSA (Figure 5-9) due to prior port development. These areas have been colonised by Alien, Invasive plant (AIP) species listed in Table 5-3. The National Environmental Management Biodiversity Act (NEMBA) classifies AIPs into the following categories:

- Category 1a: immediate compulsory control.
- Category 1b: needs to be controlled or contained.
- Category 2: permit required for removal.
- Category 3: existing plants need to be controlled in wetlands.

Table 5-3 – NEMBA declared Alien/Invasive plant species recorded in LSA.

Scientific Name	Common Name	NEMBA Category
<i>Psidium guajava</i>	Guava	3
<i>Pennisetum clandestinum</i>	Kikuyu	1b
<i>Verbena bonariensis</i>	Wild Verbena	1b
<i>Nephrolepis cordifolia</i>	Tuber sword fern	1b
<i>Lantana camara</i>	Common Lantana	1b
<i>Pennisetum villosum R.Br. ex Fresen.</i>	Feather Top	1b
<i>Mimosa pigra L.</i>	Giant sensitive plant	1b
<i>Passiflora subpeltata</i>	Wild granadilla	1b
<i>Schefflera actinophylla</i>	Umbrella tree	1b
<i>Solanum mauritianum</i>	Bugweed	1b

The AIP plan in place for the LSA should be updated with the information in this report and effectively implemented.

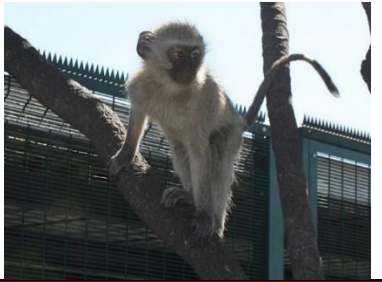
5.2.3. FAUNA

5.2.3.1. Mammals

A total of 140 mammal species has the potential to occur in the LSA. Although the National Screening tool only flags one Mammal SCC (Sensitive Sp. 8, Vulnerable) an additional 14 SCC possibly occur in the LSA based on previous sighting as per the MammalMap database (MammalMap, 2022). These species could be present in undisturbed areas of forested land, estuarine areas and grasslands as identified in Figure 5-2.

Two mammal SCC species were recorded in the LSA during the field surveys. These include African Clawless Otter (*Aonyx capensis*) - Near Threatened, and Samango Monkey (*Cercopithecus mitis labiatus*) - Vulnerable. An additional 12 SCC were identified as likely to occur in the LSA, with a further eight possibly occurring. Species specific details are presented in the table that follows (Table 5-4).

Table 5-4 – Mammal species in the LSA.

Occurrence	Common Name	Species Name	Conservation Status
Present	Vervet Monkey	<i>Chlorocebus pygerythrus</i>	Least Concern
			
Present	African Clawless Otter	<i>Aonyx capensis</i>	Near Threatened
Present	Marsh Mongoose	<i>Atilax paludinosus</i>	Least Concern
Present	Cane Rat	<i>Thryonomys swinderianus</i>	Least Concern
Present	Banded Mongoose	<i>Mungo's mungo</i>	Least Concern
Present	Slender Mongoose	<i>Herpestes sanguineus</i>	Least Concern
Present	Thick-tailed Bushbaby	<i>Galago crassicaudatus</i>	Least Concern
Present	Samango Monkey	<i>Cercopithecus mitis labiatus</i>	Vulnerable
Likely	Red Duiker	<i>Cephalophus natalensis</i>	Near Threatened
Likely	Blue Duiker	<i>Philantomba monticola</i>	Vulnerable
Possible	Leopard	<i>Panthera pardus</i>	Vulnerable
Likely	Common Dasymys	<i>Dasymys incomtus</i>	Near Threatened

Occurrence	Common Name	Species Name	Conservation Status
Likely	Four-toed Elephant Shrew	<i>Petrodromus tetradactylus</i>	Near Threatened
Likely	African Striped Weasel	<i>Poecilogale albinucha</i>	Near Threatened
Likely	Swinny's Horseshoe Bat	<i>Rhinolophus swinnyi</i>	Vulnerable
Likely	Red Bush Squirrel	<i>Paraxerus palliatus</i>	Near Threatened
Likely	Dark-footed Mouse Shrew	<i>Myosorex cafer</i>	Vulnerable
Likely	Anchieta's Pipistrelle	<i>Hypsugo anchietae</i>	Near Threatened
Likely	Schreibers's Long-fingered Bat	<i>Miniopterus schreibersii</i>	Near Threatened
Likely	Light-winged Lesser House Bat	<i>Scotoecus albobfuscus</i>	Near Threatened
Likely	Common Hippopotamus	<i>Hippopotamus amphibius</i>	Vulnerable
Possible	Sclater's Mouse Shrew	<i>Myosorex sclateri</i>	Endangered
Possible	Common Dasymys	<i>Dasymys incomtus</i>	Near Threatened
Possible	Least Dwarf Shrew	<i>Suncus infinitesimus</i>	Data Deficient
Possible	Hottentot Golden Mole	<i>Amblysomus hottentotus</i>	Data Deficient
Possible	Butterfly Bat	<i>Glauconycteris variegata</i>	Near Threatened
Possible	Geoffroy's Horseshoe Bat	<i>Rhinolophus clivosus</i>	Near Threatened
Possible	Sundevall's Leaf-nosed Bat	<i>Hipposideros caffer</i>	Rare

5.2.3.2. Herpetofauna

The national screening tool flags two herpetofauna species: Nile Crocodile (*Crocodylus niloticus*) - Vulnerable, and Mashona Hinged Terrapin (*Pelusios rhodesianus*) – Vulnerable, as potentially occurring. An additional six SCC with potential to occur have been identified from the desktop assessment (Table 5-5). The Richards Bay area hosts exceedingly high frog species diversity with over 40 species occurring. The table below shows species recorded on site during the field surveys, supplemented by the findings of listed specialist studies conducted in the LSA.

Two vulnerable species - Eastern Hinged Tortoise (*Kinixys zombensis*) and Green Mamba (*Dendroaspis angusticeps*) were recorded in the LSA. It is likely that a further six SCC are present, and one could possibly occur in the habitat present. An additional 11 species of Least Concern were also recorded, further illustrating the extent of species diversity in the study area. Species specific details are presented in the table that follows (Table 5-5).

The data collected during the desktop assessment and field surveys has highlighted that the Endangered Pickersgill's Reed Frog (*Hyperolius pickersgilli*) is likely to occur in certain habitats within the Local Study Area (LSA), along with the confirmed presence of the Near Threatened Setaro's Dwarf

Chameleon (*Bradypodion setaroi*), Vulnerable-Green Mamba (*Dendroaspis angusticeps*), Protected-Southern African Python (*Python natalensis*), and Vulnerable Eastern Hinged Tortoise (*Kinixys zombensis*). Should the habitats that support these species be affected by the proposed project (see Figure 5-9 and Table 5-1 as reference), it is recommended that a comprehensive herpetological assessment be undertaken by an experienced and qualified herpetology specialists to inform any required species specific offset requirements, and to inform a suitable offset, as part of a Biodiversity Offset Report (BOR).

Table 5-5 - Herpetofauna species in the LSA.

Occurrence	Common Name	Species Name	Conservation status
Present	African Striped Skink	<i>Trachylepis striata</i>	Least Concern
Present	Southern Foam Nest Frog	<i>Chiromantis xerampelina</i>	Least Concern
Present	Water Lily Reed Frog	<i>Hyperolius pusillus</i>	 Least Concern
Present	Bush Squeaker	<i>Arthroleptis wahlbergi</i>	Least Concern
Present	Guttural Toad	<i>Amietophrynus gutturalis</i>	Least Concern
Present (juvenile)	Flap-Necked Chameleon	<i>Chamaeleo dilepis</i>	 Least Concern
Present	Painted Reed Frog	<i>Hyperolius marmoratus</i>	Least Concern
Present	Brown-backed Tree Frog	<i>Leptopelis mossambicus</i>	Least Concern

Occurrence	Common Name	Species Name	Conservation status
Present	Eastern Hinged Tortoise	<i>Kinixys zombensis</i>	Vulnerable
Present	Argus Reed Frog	<i>Hyperolius argus</i>	Least Concern
Present	Tinker Reed Frog	<i>Hyperolius tuberilinguis</i>	Least Concern
Likely	Natal Hinged Tortoise	<i>Kinixys natalensis</i>	Vulnerable
Present	Bubbling Kassina	<i>Kassina senegalensis</i>	Least Concern
Present	Southern African Python	<i>Python natalensis</i>	Least Concern, Provincially Protected
Likely	Gaboon Adder	<i>Bitis gabonica</i>	Vulnerable, Provincially Protected
Possible	Nile Crocodile	<i>Crocodylus niloticus</i>	Vulnerable
Present	Green Mamba	<i>Dendroaspis angusticeps</i>	Vulnerable
Present (juvenile)	Serato's Dwarf Chameleon	<i>Bradypodion setaroi</i>	 Near Threatened
Likely	Large-scaled Grass Lizard	<i>Chamaesaura macrolepis</i>	Near Threatened
Likely	Spotted Shovel-nosed Frog	<i>Hemisus guttatus</i>	Vulnerable
Likely	Pickersgill's Reed Frog	<i>Hyperolius pickersgilli</i>	Endangered

5.2.3.3. Avifauna

The DFFE screening tool has identified 16 avifaunal SCC as potentially occurring within the LSA. The table below presents both the species recorded during on-site surveys and those considered likely to occur, based on field survey findings and supplementary data from previously conducted specialist studies (Allan, 2024).

Table 5-6 – Avian species in the LSA.

Occurrence	Common Name	Species Name	Conservation Status
Present	Pied Kingfisher	<i>Ceryle rudis</i>	Least Concern
Present	Malachite Kingfisher	<i>Corythornis cristatus</i>	Least Concern
Present	Brown-hooded Kingfisher	<i>Halcyon albiventris</i>	Least Concern
Present	Little Egret	<i>Egretta garzetta</i>	Least Concern
Present	African-Fish Eagle	<i>Haliaeetus vocifer</i>	Least Concern
Present	Palm-nut Vulture	<i>Gypohierax angolensis</i>	Least Concern
Present	Diederik Cuckoo	<i>Chrysococcyx caprius</i>	Least Concern
Present	African Jacana	<i>Actophilornis africanus</i>	Least Concern
Present	African Woolly-necked Stork	<i>Ciconia microscelis</i>	Least Concern
Present	Yellow-billed Kite	<i>Milvus aegyptius</i>	Least Concern
Present	African Pied Wagtail	<i>Motacilla aguimp</i>	Least Concern
Present	Common Sandpiper	<i>Actitis hypoleucos</i>	Least Concern
Present	Black-collared Barbet	<i>Lybius torquatus</i>	Least Concern
Present	Speckled Mousebird	<i>Colius striatus</i>	Least Concern
Present	Whimbrel	<i>Numenius phaeopus</i>	Least Concern
Present	African Palm Swift	<i>Cypsiurus parvus</i>	Least Concern
Present	Eurasian Curlew	<i>Numenius arquata</i>	Near Threatened
Present	Common Ringed Plover	<i>Charadrius hiaticula</i>	Least Concern
Present	Grey-hooded Gull	<i>Chroicocephalus cirrocephalus</i>	Least Concern
Present	African Golden-Weaver	<i>Ploceus subaureus</i>	Least Concern
Present	Pied Crow	<i>Corvus albus</i>	Least Concern
Present	Blacksmith Lapwing	<i>Vanellus armatus</i>	Least Concern
Present	Eastern Thick-billed Weaver	<i>Amblyospiza albifrons ssp. woltersi</i>	Least Concern
Present	Water Thick-knee	<i>Burhinus vermiculatus.</i>	Least Concern
Present	East African Harrier-Hawk	<i>Polyboroides typus</i>	Least Concern
Present	African Marsh Harrier	<i>Circus ranivorus</i>	Endangered
Present	African Three-banded Plover	<i>Thinornis tricoloris</i>	Least Concern
Present	Great White Pelican	<i>Pelecanus onocrotalus</i>	Vulnerable
Present	Pink-backed Pelican	<i>Pelecanus rufescens</i>	Vulnerable
Present	Kelp Gull	<i>Larus dominicanus</i>	Least Concern
Present	Grey-hooded Gull	<i>Chroicocephalus cirrocephalus</i>	Least Concern
Present	Eastern Little Bee-Eater	<i>Merops pusillus ssp. meridionalis</i>	Least Concern
Likely	Fiery-necked Nightjar	<i>Caprimulgus pectoralis</i>	Least Concern

Occurrence	Common Name	Species Name	Conservation Status
Likely	African Finfoot	<i>Podica senegalensis</i>	Vulnerable
Possible	African Pigmy Goose	<i>Nettapus auratus</i>	Vulnerable
Possible	Crowned Eagle	<i>Stephanoaetus coronatus</i>	Vulnerable
Likely	Caspian Tern	<i>Hydroprogne caspia</i>	Vulnerable
Likely	Denham's Bustard	<i>Neotis denhami</i>	Vulnerable
Likely	Lesser Jacana	<i>Microparra capensis</i>	Vulnerable
Present	Mangrove Kingfisher	<i>Halcyon senegaloides</i>	Endangered
Likely	Saddle-billed Stork	<i>Ephippiorhynchus senegalensis</i>	Endangered
Possible	Southern banded Snake Eagle	<i>Circaetus fasciolatus</i>	Critically Endangered
Likely	Spotted ground thrush	<i>Geokichla guttata</i>	Vulnerable
Possible	Tawny Eagle	<i>Aquila rapax</i>	Endangered
Likely	Yellow-billed Stork	<i>Mycteria ibis</i>	Endangered

5.2.3.4. Invertebrates

The national screening tool flags four potential SCC invertebrate species. Species present in the LSA, in addition to species flagged by the screening tool are detailed in Table 5-7. The East African Fiddler Crab (*Austruca occidentalis*), although not SCC, is an important ecosystem indicator species. They frequented the LSA estuarine habitat and can be used to infer the healthy functioning of the ecological system (Nehemia and Kochzius, 2017).

Several species with a conservation status of "Data Deficient" were confirmed on site. The term "Data Deficient" (DD) is a conservation status assigned by the International Union for Conservation of Nature (IUCN) when there is insufficient information available to make a direct or indirect assessment of a species' risk of extinction. This designation does not imply that the species is not at risk, but rather that more research is needed to determine its population trends, distribution, ecological requirements, and potential threats. As such, Data Deficient species should not be overlooked in conservation planning, as they may be at significant risk but simply lack adequate data for proper evaluation.

Table 5-7 – Invertebrate species in the LSA.

Common Name	Species Name	Conservation Status
Longhorn Kitespider	<i>Gasteracantha milvodes</i>	Data Deficient

Common Name	Species Name	Conservation Status
Giant African Land Snail	<i>Lissachatina fulica</i>	Least Concern 
Truncated Mangrove Snail	<i>Cerithidea decollata</i>	Least Concern 
	<i>Anisoptera sp.</i>	Data Deficient 
Flat-necked Shieldback	<i>Arytropteris basalis</i>	Vulnerable
East Coast Katydid	<i>Pomatonota dregii</i>	Vulnerable
Gossamer-winged Butterfly	<i>Teriomima zuluana</i>	Vulnerable
Millar's buff	<i>Deloneura millari</i>	Vulnerable
African Honeybee	<i>Apis mellifera scutellata</i>	Least Concern
	<i>Taphronota calliparea</i>	Data Deficient 

Common Name	Species Name	Conservation Status
Lawn Wolf Spider	<i>Hippasa holmerae</i>	Data Deficient 
Goldband Thyene Jumping Spider	<i>Thyene natalii</i>	Data Deficient 
East African Fiddler Crab	<i>Austruca occidentalis</i>	Least Concern 
Grapsid Crab	<i>Grapsidae</i>	Data Deficient

5.2.4. IMPACTS ON BIODIVERSITY AND DRIVERS OF CHANGE

5.2.4.1. Current

The Local Study Area (LSA) is disturbed by several anthropogenic features, including security gates and tarred roads, which act as barriers to faunal movement. Despite these intrusions, the implementation of strict access control protocols has resulted in large portions of the LSA remaining relatively undisturbed over an extended period. This has facilitated advanced stages of ecological succession and supported the proliferation of both faunal and floral biodiversity.

In contrast, the northern extent of the LSA contains areas that were previously transformed during port development activities (Figure 5-4). These zones have been extensively colonised by alien invasive plant (AIP) species and currently hold limited ecological value.

From a biodiversity connectivity and faunal corridor perspective, the LSA is bounded by built-up port infrastructure to the north, a canal to the south and west, and the harbour to the east. Given these surrounding barriers, it is likely that the LSA does not function as part of a terrestrial ecological corridor.

5.2.4.2. Historical

Historical imagery from 2006 indicates that portions of the Local Study Area (LSA) were previously utilized for construction-related activities. This is evidenced by the infilling of a waterbody, the presence of caissons within the estuary, and designated areas for material storage and dumping (Figure 5-13).

Currently, a narrow fringe of white and black mangroves line the small, tidally influenced pool located inland of the Assembly Basin (shown in Figure 5-13). Additionally, scattered mangrove trees were observed within the Assembly Basin itself. According to Mostert (2014), the mangrove communities associated with the tidally influenced pool exhibit exceptionally high ecosystem functionality.

The current distribution and composition of vegetation types across the LSA reflect ecological recovery and succession that has occurred subsequent to the noted historical impacts.

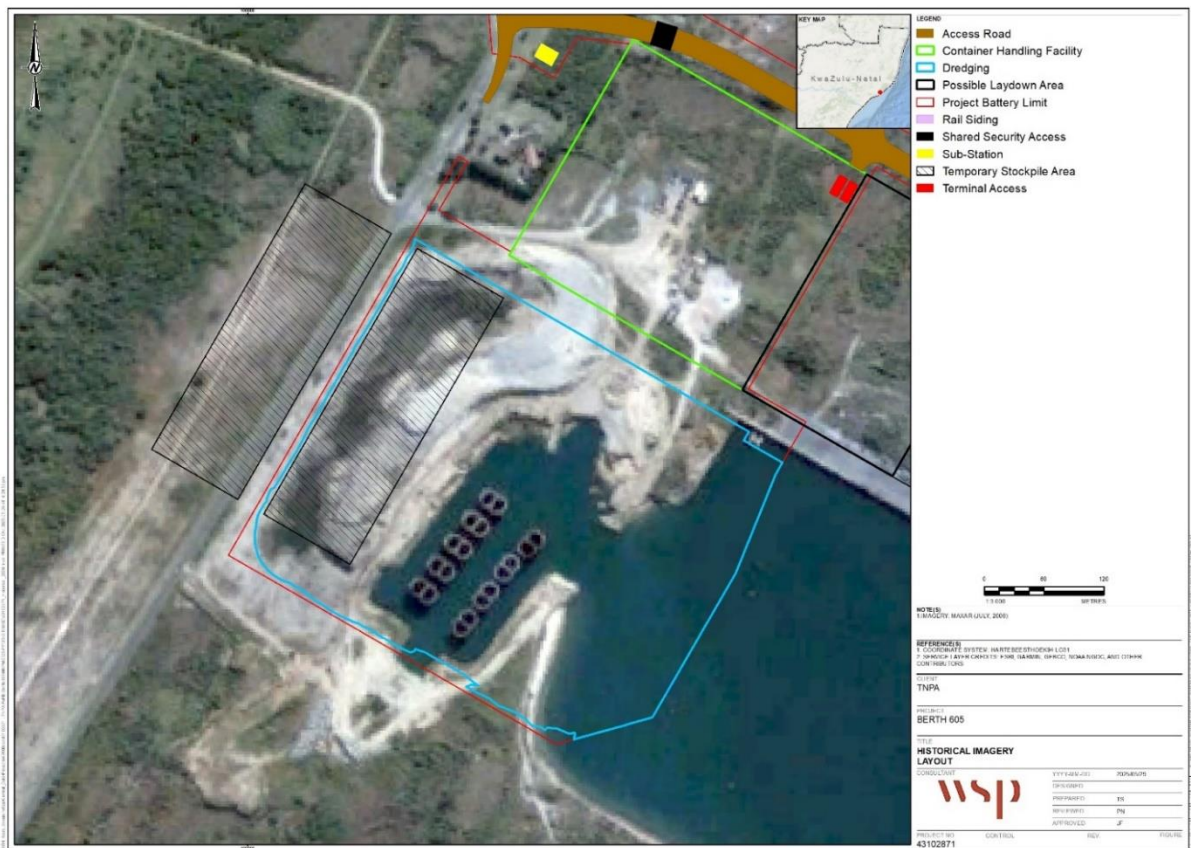


Figure 5-10 - Aerial view of the project area in 2006 showing caissons in the Assembly Basin in the 600 Berth Basin in the Port of Richards Bay. The berm that sealed the basin has been breached in preparation of caisson floating to Berth 306. The existing tidally influence pool referred to in the text is visible.

5.3. SITE SENSITIVITY VERIFICATION OUTCOME

The findings of the site sensitivity verification exercise, based on the data gathering activities

conducted to date (inclusive of previously conducted studies, literature review and field surveys), together with the anticipated reporting requirements as stipulated by the various protocols, are summarised in Table 5-8.

The following habitat types and their associated SEI have been identified in the LSA (Figure 5-9).

1. Completely Transformed Area (Very Low SEI).
2. Secondary Grasslands and Woodlands (Low SEI).
3. Moist Grasslands (Medium SEI).
4. Coastal Forest (High SEI).
5. *Bruguiera gymnorrhiza* mangrove forests (Very High).

Table 5-8 – Site sensitivity verification results.

Theme	Screening tool sensitivity	Site-based sensitivity
Terrestrial biodiversity	VERY HIGH Estuarine Habitat and Maputuland Coastal Grassland Habitat.	Very High CBA 1 (Critical Biodiversity Area Irreplaceable)/ <i>Bruguiera gymnorhiza</i> mangrove forests. Supports various confirmed Species of Conservation Concern (SCC).
		Very High CBA 1 (Critical Biodiversity Area Irreplaceable)/Coastal Forest. Supports various confirmed Species of Conservation Concern (SCC).
		Very High CBA 1 (Critical Biodiversity Area Irreplaceable)/Moist Grasslands. Supports various confirmed Species of Conservation Concern (SCC).
		Low Secondary Grasslands/Woodlands
		Low Transformed Habitat

Theme	Screening tool sensitivity	Site-based sensitivity
Animal species	HIGH	High <ul style="list-style-type: none"> Animal species abundance and diversity in forests and estuaries with multiple confirmed Animal SCC. Likely presence of Endangered Pickersgill Reed Frog (<i>Hyperolius pickersgilli</i>) and other reptile SCC's.
		Low Transformed Habitat, Secondary Grasslands/Woodlands
Plant species	MEDIUM	Medium Plant species abundance, diversity and SCC presence is high in forests and estuaries.
		Low Transformed Habitat, Secondary Grasslands/Woodlands

6. IMPACT ASSESSMENT OUTCOMES

6.1. RECEPTOR SENSITIVITY

Although all species and natural habitats/ecosystems occurring within an area of interest form a component of the overall biodiversity and ecological value, it not necessary to manage or mitigate potential effects of a project on a species-specific basis; instead, SCC and sensitive habitats are used as a proxy, since by assessing and managing potential impacts on these, then other species are also afforded protection. For example, by ensuring bird SCC such as breeding Great white pelican are shielded from disturbance during construction/operation activities, so too will other more common bird species that may be of less immediate conservation priority.

Similarly, since most species are generally linked to particular vegetation communities or ecosystems, the application of management measures at a landscape or ecosystem level is more feasible and effective in terms of species conservation than attempting to conserve or manage at the species/individual level; therefore, areas of natural habitat that support significant communities of flora/fauna SCC are also included as receptors for the impact assessment.

The sensitivity of the mapped terrestrial ecosystem receptors (shown in Figure 5-9) (and linked SCC) within the Project area that may be potentially impacted by the proposed development is summarised in Table 5-1 of Section 5.3.

The construction and operation of the proposed new infrastructure is anticipated to result in the following key impacts on terrestrial biodiversity receptors:

- Direct impacts through clearing of land and resultant loss of biodiversity (flora and fauna SCC) as well as ecosystems of concern.
- Establishment and spread of alien and invasive species.
- Loss and fragmentation of faunal habitats.

The outcomes of the impact assessment are described in detail in the following sections.

6.2. IMPACTS ON THE RECEIVING ENVIRONMENT

A discussion on assessed impacts for each stage of the proposed Project is provided in the sections below, with a summary table presented in Table 6-1 - Terrestrial Biodiversity Impact Summary.

The general character or nature of an identified impact is described in detail where it is first discussed in the text. Thereafter, only the relevance of the impact to the specific Project phase or activity is discussed.

6.2.1. CONSTRUCTION PHASE

6.2.1.1. Vegetation Clearing and Earth Works: Loss and fragmentation of natural habitat.

The construction phase will result in the fragmentation of habitat of importance on a regional level for foraging, breeding and refugia habitat provision for fauna species of concern, as well as the maintenance of landscape connectivity for their movements. The potential for sensory disturbances to fauna arising from noise and human/mechanical presence during both construction and operation of the proposed infrastructure, resulting in reduced habitat availability, is considered high within the area in which noise impacts are expected.



The magnitude of the potential impact of reduced habitat availability and physical habitat loss and fragmentation is therefore, considered high in the context of the habitat present with limited disturbance. The impact would persist throughout the construction and operational phase, occur at a regional scale, and is considered highly probable, resulting in an impact of 'Very High' significance prior to mitigation.

It is impractical to effectively mitigate the impact on the receiving environment, due to the nature of the impact (dredging and complete clearance) and the sensitivity of the receiving environment. In the case that the project proceeds, the residual negative impact would remain of 'High' significance and a Terrestrial Biodiversity Offset would be necessary, in line with the mitigation hierarchy to ensure no net biodiversity loss. The offset ratio and species-specific protocol would need to be secured and agreed with DFFE and Ezemvelo Wildlife. In line with the SANBI biodiversity offset guidelines, a 30:1 starting ratio is required.

6.2.1.2. Vegetation Clearing and Earth Works: Establishment and spread of AIP.

Habitat disturbances caused by vegetation clearing and earth works during site establishment/construction is likely to facilitate the establishment and spread of AIS. Once established, AIS can spread, suppress and replace indigenous vegetation. This may compromise ecosystem integrity resulting in a loss of biodiversity. NEMBA listed AIS were recorded in the study area, including inter alia; *Chromolaena odorata* and *Lantana camara*, which are potentially highly problematic species in forest habitats. Vegetation clearing and earth works during site establishment/construction may therefore facilitate the establishment and spread of AIP species.

Before mitigation, AIS colonisation is rated as an impact of "High" significance. This impact can be effectively managed through the implementation of an AIS Control and Eradication Plan for the study area. With a plan in place and actively implemented, the after-mitigation impact significance is reduced to "Moderate".

6.2.1.3. Vegetation Clearing and Earth Works: Injury and mortality of fauna SCC.

The construction activities associated with vegetation clearing and extensive earthworks pose a significant threat to faunal species of conservation concern (SCC) within the project area. These operations often result in direct injury or mortality of terrestrial fauna due to machinery movement, habitat disturbance, and the removal of sheltering vegetation. Species with limited mobility or those dependent on specific microhabitats are particularly vulnerable. The disruption of ecological corridors and the fragmentation of habitats further exacerbate the risk, potentially leading to population declines or local extirpation. Subsequently, this impact is expected to be of "Very High" significance and even with the application of mitigation measures the impact remains "High".

6.2.1.4. Vegetation Clearing and Earth Works: loss of flora SCC.

The removal of native vegetation during the construction phase, particularly in areas designated for dredging and port infrastructure, is expected to result in the loss of flora SCC. These species have restricted distributions and specific habitat requirements, making them highly susceptible to land transformation. The clearing of vegetation not only eliminates individual plants but also disrupts soil structure and microclimatic conditions necessary for regeneration. Additionally, the introduction of invasive species and changes in hydrology due to earthworks can further threaten the persistence of these flora. Subsequently, this impact is expected to be of “High” significance, with the application of mitigation measures the impact can be reduced to “Medium”.

6.2.1.5. Vehicle/machinery collisions, Hunting/snaring by construction workers, Increased sensory disturbance from dust or noise generation.

The bulk earthworks involved in site development have the potential to injure/kill individual fauna SCC. This impact could affect Pickersgill's Reed Frog and Eastern Hinged Tortoise, both of which are relatively slow moving, and as such are vulnerable to heavy machinery movements and site clearance activities. The bulk earthworks and associated heavy machinery activity could also affect breeding avifaunal SCC (Caspian Tern, Mangrove Kingfisher, Great White and Pink-backed Pelican) through sensory disturbances which may reduce the quality/desirability of the currently established breeding site in the nearby Richards Bay Game Reserve.

The magnitude of the potential impact on bird SCC and herpetofauna SCC is expected to be significant given the habitat conditions present. The impact results in an impact of ‘Moderate’ significance on animal species SCC, prior to mitigation. With the application of mitigation measures the impact can be reduced to ‘Low’ significance.

6.2.2. OPERATIONAL PHASE

Operational phase impacts relate to the possible exacerbation of the current impacts of loss of regionally protected plant and animal species and the risk of injury/mortality presented to fauna by vehicular traffic and infrastructure.

6.2.2.1. Injury and mortality of fauna SCC.

Increased vehicular traffic during the operation phase may pose a risk of injury and mortality of fauna SCC (and non-SCC). The magnitude of the potential impact on fauna during the operational phase is expected to be high given natural state habitat condition present, and the effect of the preceding construction works. The impact would occur throughout the operation phase, affect fauna at a local scale and is considered probable, resulting in an impact of ‘High’ significance prior to mitigation.

The application of the recommended mitigation measures, acting to reduce both the potential magnitude and the probability of the impact occurring, are predicted to result in a residual impact of “Moderate” significance.



Table 6-1 - Terrestrial Biodiversity Impact Summary.

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	Magnitude	Impact Extent	Impact Reversibility	Impact Duration	Probability of occurrence	Significance	Significance without Mitigation	Magnitude	Impact Extent	Reversibility	Impact Duration	Probability of occurrence	Significance	Significance without Mitigation
Construction Phase																
Vegetation Clearing and Earthworks	Loss and fragmentation of natural habitat	Sensitive habitats, fauna SCC	5	3	4	5	5	85	Very High	5	3	4	4	4	80	High
Vegetation Clearing and Earthworks	Establishment and spread of AIS	Sensitive habitats, flora SCC	5	3	3	5	5	80	High	3	2	2	4	3	33	Moderate
Vegetation Clearing and Earthworks	Injury and mortality of fauna SCC	Birds, Reptile and Mammal SCC	5	3	4	5	5	85	Very High	4	4	4	5	4	68	High
Vegetation Clearing and Earthworks	Loss of flora SCC	Natural Flora	5	4	5	5	4	76	High	3	2	2	4	3	33	Moderate
Vehicle/machinery collisions, Hunting/snaring by construction workers, Increased sensory disturbance from dust or noise generation	Injury and mortality of fauna SCC	Fauna SCC	4	3	3	4	3	42	Moderate	2	2	3	4	2	22	Low



ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	Magnitude	Impact Extent	Impact Reversibility	Impact Duration	Probability of occurrence	Significance	Significance without Mitigation	Magnitude	Impact Extent	Reversibility	Impact Duration	Probability of occurrence	Significance	Significance without Mitigation
Operational Phase																
Vehicle/machinery collisions, Hunting/snaring by construction workers, Increased sensory disturbance from dust or noise generation	Injury and mortality of fauna SCC	Natural Fauna	5	5	2	4	5	68	High	3	4	2	3	5	42	Moderate

6.2.3. CUMULATIVE IMPACTS

The entirety of the Project area is mapped as CBA 1: Irreplaceable by the KZN Biodiversity Sector Plan on the bases of terrestrial and estuarine sensitivities. However, the northern areas of the Project footprint have been verified to consist of transformed/ low SEI environmental conditions (Figure 5-9). The same cannot be said for the southern extent of the Project area which consists of Very High SEI Estuarine and Forest habitat. Due to years of ecological succession its current condition supports the CBA 1 designation. Development in this area would result in loss of both plant and animal SCC as well as compromise protected terrestrial habitats resulting in cumulative impacts on terrestrial biodiversity receptors. The development of the proposed infrastructure will also contribute to increased indirect cumulative impacts on nearby intact habitats and species such as noise pollution and AIP proliferation.

The Port of Richards Bay is exploring development opportunities under the PoRB Master Plan 2021. Various development opportunities were identified by TNPA across three precincts namely South Dunes, Newark and Bayvue and are reflected in the PDFP and the PoRB Master Plan 2021 – 2035.

The Berth 605 project area is located within the Bayvue Precinct of the PoRB and identified as Project 1. The precinct is situated on the northern side of the port, between Alusaf aluminium smelter in the west, Thulazihleka pan in the north and Tuzi-gazi in the east. Effectively the precinct accommodates dry bulk, break bulk and liquid bulk terminals which include significant road, rail, building and services infrastructure. Cumulative impacts therefore need to take the master plan and the other precincts into consideration for accuracy.

The cumulative impacts of the project are therefore significant potentially resulting in losses of SCC animal and plant species as well as protected Estuarine habitat. It is therefore recommended that the footprint avoids all undisturbed very high and high SEI habitat described in the preceding sections. However, it is noted that many of these areas are earmarked for current and future development as part of the Port Masterplan. An updated Biodiversity Management plan and effective implementation of the existing AIS Management Plan is paramount to address the proposed Berth 605 footprint.

In the case that avoidance is not feasible given the project design requirements, which it is the current understanding is the case, significant residual negative impact to high and high sensitivity areas (estuarine and terrestrial) will need to be offset as per the final option available in the mitigation hierarchy, and a BOP will be required. In line with protocol at 30:1 ratio is recommended. However, the extent and quanta required to address the negative residual impact could be negotiated with the relevant authority and Ezemvelo Wildlife.

6.3. MITIGATION MEASURES

This section details mitigation measures required to avoid, minimise, rehabilitate or offset identified impacts to terrestrial biodiversity, fauna and flora receptors in line with the mitigation hierarchy. Detail is provided in the text and summarised at a high level to detail the proposed mitigation measures and how they align with the habitats and sensitivities determined.

The following approach is proposed to mitigate impact to the very high and high sensitivity habitats/CBA1 areas:

- Avoidance of High and Very high sensitivity areas if possible.
- However, if avoidance is not feasible given the project design requirements, which it is the current understanding is the case, a Biodiversity Offset Plan (BOP) is required after all mitigation measures

have been investigated and deemed ineffective at lowering the impact on terrestrial biodiversity receptors. This is to account for the loss of habitat within a CBA 1 confirmed terrestrial environment and to ensure no net loss. As per the offset guidelines a 30:1 offset ratio is recommended for CBA1. However, a lesser ratio could be motivated based on the site-specific characteristics. A lesser offset ratio could only be confirmed on consultation with, and written confirmation from, EKZN (Ezemvelo KZN Wildlife) and the DFFE (Department of Fisheries, Forestry and the Environment). Further guidance on the approach and requirements going forwards in developing the biodiversity offset plan and biodiversity management plan are provided in Sections 6.3.2 and 6.3.3, respectively.

- The likelihood of occurrence of several SCC herpetofaunal species have been determined to be high, or the species confirmed to be present. An additional assessment by a herpetofaunal specialist will need to form part of the biodiversity offset plan to determine what species offsets, if any, are applicable and therefore may need to be integrated into the larger biodiversity offset plan.

Mitigation measures that are designed to avoid and minimise the loss and degradation of the ecological resources in the LSA, with specific focus on addressing impacts in Low and Medium SEI areas and avoidance and minimisation of impacts to SCC, are as follow.

- To prevent loss of flora of conservation concern beyond the direct disturbance footprint, prior to any vegetation clearing, the development footprints should be clearly marked out with flagging tape/posts in the field. Vegetation clearing should be restricted to the proposed project footprints only, with no clearing or disturbance permitted outside of these areas.
- A search and rescue survey for all flora SCC should be conducted within the marked footprints prior to the commencement of construction to determine the number of potentially impacted plant species of conservation concern. This will form part of a protected plant walkdown undertaken by a specialist ECO. Based on the findings of the survey, clearing and/or relocation permits should be obtained from the relevant authority to clear or rescue and relocate potentially impacted plant SCC to adjacent areas of natural habitat.
- It is recommended that no large plant specimens should be translocated prior to developing the project area, unless previously proven success is confirmed. As an alternative mitigation measure, the budget that would have been allocated to translocation of large plant specimens should instead be allocated to the purchase of more conservation land as part of the offset so that these species can be conserved in-situ.
- A search and rescue survey for all fauna SCC should also be conducted within these marked footprints prior to the commencement of construction to determine the number of potentially impacted animal species of conservation concern and relocate all found individuals.
- A search and rescue survey for herpetofauna species, most notably those confirmed in this report, should be done immediately prior to site clearance activities/ before construction. Any observed individuals should be relocated to nearby areas of natural habitats. Where snakes require relocation, this should be done by a certified snake handler for health and safety reasons.
- Search and rescue operations for fauna must be undertaken during the period of the year when species are most likely to be active to ensure that individuals are locatable for capture and relocation.
- The Alien Invasive Plant Management Plan for the project must be updated with the findings of this report and effectively implemented. Further detail provided in Section 6.3.1.
- The rules and regulations concerning all wildlife should be communicated to mine workers and contractors through on-site signage and awareness training (induction).

- An incidence register should be maintained throughout all phases of the Project detailing any wildlife mortalities/injuries caused by on-site activities. The register should be used to identify additional biodiversity management requirements.
- Speed limits should be expanded to construction areas via appropriate signage and enforced on all access roads to proposed new infrastructure locations. Dust suppression activities should also be expanded to include additional road at new infrastructure areas.
- No animals may be hurt or killed during any phase of the development. It will form part of the specialist ECO duties to record and relocate any species at risk to adjacent areas of natural habitat within the Project area once development commences.
- Rehabilitation of all disturbed areas, specifically the lay down areas, to be completed with the goal of rehabilitation to be to return disturbed areas to approximate the pre-disturbance habitat characteristics.
- Propagated SCC plants should be used in rehabilitation/restoration efforts to replace the loss of SCC sustained during vegetation clearing.

Table 6-2 – Site sensitivity verification results and applicable required mitigation actions to allow development to proceed as proposed.

Theme	Screening tool sensitivity	Site-Based sensitivity	Required action for development to proceed
Terrestrial biodiversity	VERY HIGH Estuarine Habitat and Maputoland Coastal Grassland Habitat.	Very High CBA 1 (Critical Biodiversity Area Irreplaceable) forests and estuarine habitat with various confirmed Species of Conservation Concern (SCC).	A Biodiversity Offset Plan (BOP) is required after all mitigation measures have been investigated and deemed ineffective at lowering the impact on terrestrial biodiversity receptors. This is to account for the loss of habitat within a CBA 1 confirmed terrestrial environment and to ensure no net loss. As per the offset guidelines a 30:1 offset ratio is recommended for CBA1. However, a lesser ratio could be motivated based on the site-specific characteristics. A lesser offset ratio could only be confirmed on consultation with, and written confirmation from, EKZN (Ezemvelo KZN Wildlife) and the DFFE (Department of Fisheries, Forestry and the Environment).
		Low Transformed Habitat, Secondary Grasslands/Woodlands	Application of the recommended mitigation measures as detailed in this report.
Animal species	HIGH	High <ul style="list-style-type: none"> Animal species abundance and diversity in forests and estuaries with multiple confirmed Animal SCC. Likely presence of Endangered Pickersgill Reed Frog (<i>Hyperolius pickersgilli</i>). This will be further clarified in the BOP (Biodiversity Offset Plan by a Herpetofauna specialist). 	<ul style="list-style-type: none"> Separate Herpetology specialist study is required to assess the presence of the Endangered Pickersgill Reed Frog (<i>Hyperolius pickersgilli</i>) as well as assess the habitat preference and species abundance of Green Mamba (<i>Dendroaspis angusticeps</i>) and Serato's Dwarf Chameleon (<i>Bradypodion setaroi</i>) Search and Rescue of all SCC animals recorded in the footprint and relocation to suitable habitat in the biodiversity offset area identified in the presence of a specialist terrestrial ECO. Due to the high sensitivity's present in the LSA, a specialist ECO should oversee the preconstruction and construction phase to ensure effective identification and translocation of species.

Theme	Screening tool sensitivity	Site-Based sensitivity	Required action for development to proceed
		Low Transformed Habitat, Secondary Grasslands/Woodlands	Application of the recommended mitigation measures as detailed in this report.
Plant species	MEDIUM	Medium Plant species abundance, diversity and SCC presence is high in forests and estuaries.	<ul style="list-style-type: none"> ■ Search and Rescue of SCC plants recorded in the footprint and relocation to suitable habitat in the identified Biodiversity offset area. ■ Where mature SCC trees are involved, budget should instead be reallocated to increasing the Terrestrial Offset area in the presence of a specialist terrestrial ECO. ■ Due to the high sensitivity's present in the LSA, a specialist ECO should oversee the preconstruction and construction phase to ensure effective identification and translocation of species.
		Low Transformed Habitat, Secondary Grasslands/Woodlands.	Application of the recommended mitigation measures as detailed in this report.

6.3.1. ALIEN AND INVASIVE SPECIES MANAGEMENT PLAN

An alien and invasive species management plan exists for the LSA. It is critical that this plan is effectively implemented by experienced and qualified contractors. It is imperative that the correct plant species are removed and disposed of safely. Alien trees being felled are not to be dropped on the animal species below. If poison control is used the discarded bottles should be disposed of safely and not left overnight in the LSA, as this has the potential to poison animal SCC's.

6.3.2. BIODIVERSITY OFFSET PLAN (BOP)

The proposed development is occurring in a CBA 1: Irreplaceable habitat with confirmed plant and animal SCC, and there is no reasonable way to mitigate the effects of the development on the environmental receptors discussed.

Therefore, in line with the mitigation hierarchy (Figure 6-1) and the National Biodiversity Offset Guideline (Government Gazette 48841 (Notice No. 3569)) (DFFE, 2023), a Biodiversity Offset Plan (BOP) is required to address significant residual impacts. Due to the sensitivity of the habitat and SCC occurring, a 30:1 offset ratio is the starting point as per the guideline. However, this ratio could be lowered on consultation with the DFFE and Ezemvelo/ KZN Wildlife and based on the site-specific situation. The biodiversity offset should consider the current operational footprint and proposed new berth 605 footprint and temporary stockpiles.

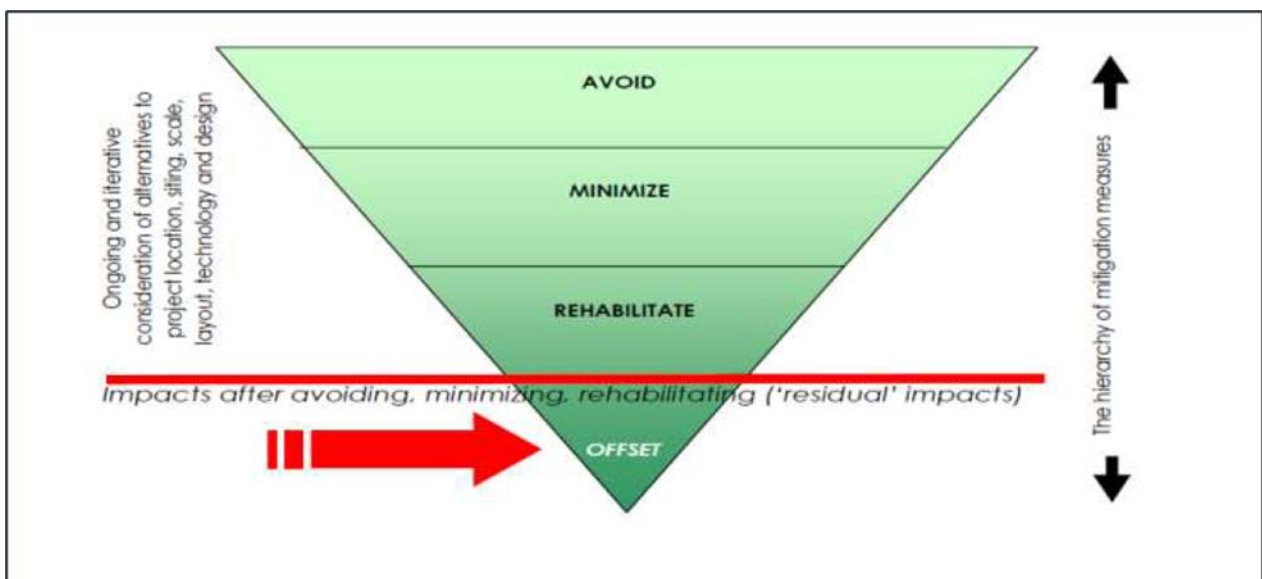


Figure 6-1 - The mitigation hierarchy (DFFE, 2022)

It is pertinent to note that all mitigation alternatives have been considered and evaluated. There is no practical way to reduce the loss of this ecosystem given the envisioned layout. In line with the mitigation hierarchy, an offset is the last remaining option as even with all mitigations applied the loss of terrestrial biodiversity is not within an acceptable limit.

Additionally, the Estuarine and Marine Ecology Specialist Study compiled by the CSIR (2024) concluded that *“the most ecologically sensitive and important habitat in the Berth 605 Project footprint is the small tidally influenced pool inland of the Assembly Basin. The pool is fringed by mangrove*

trees, including black mangrove, a protected tree in terms of the National Forestry Act. There is a high diversity and abundance of fish and pelagic and benthic invertebrates in the pool. This area will be affected by the proposed development, and therefore it is envisaged that a biodiversity offset will need to cater for impacts to both the terrestrial and estuarine ecosystems.

The National Biodiversity Offset guideline (DFFE, 2023) requires that the below-listed principles, which are widely recognised in standard offset guidance (e.g. BBOP, 2009) – guide the selection of suitable candidate offset sites:

- Biodiversity offset sites should be selected for ecological equivalence (the “like-for-like” principle) or, where appropriate, there could be “trading-up” to select an area of relatively high or more urgent conservation priority.
- Selection should be guided as far as possible by existing biodiversity priority areas in the landscape (for example, the CBA and ESA network, Freshwater Ecosystem Priority Areas, and focus areas for protected area expansion) and/or areas identified as strategic from an ecological infrastructure perspective (such as Strategic Water Source Areas).
- Biodiversity offsets should strive to secure the best examples of the features which have been impacted and to improve connectivity in the landscape between protected and priority areas for biodiversity.
- The final selection can be influenced by the reasonable consideration of factors other than the biodiversity value of the different candidate sites, such as ease of the management of the site by a relevant management authority; and threats to conservation due to conflicting land use rights, claims or land use classification.

Based on the above detailed principles, the following high-level options may be feasible:

- Offset areas have been earmarked as part of the Port Masterplan. These areas require further field surveys to assess their suitability regarding terrestrial biodiversity receptors.
- A potential restoration alternative could be possible, ideally local and close to the LSA which could be preferable for species movement and preservation of ecological processes. Once again, these areas would need to be further assessed, possibly including additional surveys.

A BOP is beyond the scope of this report but will need to be drafted to evaluate the potential of both of the above options to suggest practical recommendations.

6.3.3. BIODIVERSITY MANAGEMENT PLAN

A Biodiversity Management Plan (BMP) outlines the project's biodiversity management initiatives, commitments, and obligations to safeguard and promote the viability of priority species and habitats. It includes mitigation and management measures for the pre-construction and construction phases, with a separate operational BMP to be prepared before commissioning. The BMP aims to ensure compliance with relevant legislation, provide a baseline biodiversity summary, identify impact activities, specify management and mitigation actions, and set monitoring and evaluation criteria.

- A Biodiversity Management Plan (BMP) must be developed for the project prior to commencement, if not already available. If a BMP already exists, this must be updated to reflect the outcomes of this and other recommended additional studies, e.g.: the biodiversity offset plan. The BMP must reflect the biodiversity risks and additional risk reduction measures (i.e. mitigation, rehabilitation, and offset measures) outlined in this document, since these will be required to achieve the overall biodiversity management objectives for the Project area.

- Inclusion of a practical framework and schedule, details of key performance indicators, and recommended monitoring protocols for the delivery of existing and currently recommended mitigation measures in the BMP is recommended.

6.4. MONITORING REQUIREMENTS

The following monitoring requirements are proposed and should be incorporated into the BMP:

- An alien and invasive species management plan exists for the LSA. It is critical that this plan is effectively implemented by experienced and qualified contractors.
- A record of fauna mortalities/injury due to interactions with Project infrastructure/activities should be kept on site and regularly reviewed to inform the need for implementation of any additional mitigation measures.
- A specialist ECO is required to be on site through the Search and Rescue as well as BOP Phases.

6.5. CUMULATIVE IMPACTS

The entirety of the Project area is mapped as CBA 1: Irreplaceable by the KZN Biodiversity Sector Plan on the bases of terrestrial and estuarine sensitivities. However, the Northern areas of the Project footprint have been verified to consist of transformed/ low SEI environmental conditions (Figure 5-9). The same cannot be said for the Southern extent of the Project area which consist of Very High SEI Estuarine and Forest habitat. Due to years of ecological succession its current natural state condition supports the CBA 1 designation. Development in this area would result in loss of both plant and animal SCC as well as compromise protected terrestrial habitats resulting in long reaching cumulative impacts on terrestrial biodiversity receptors. The development of the proposed infrastructure will also contribute to increased indirect cumulative impacts on nearby intact habitats and species such as noise pollution and proliferation.

The Port of Richards Bay is exploring development opportunities under the PoRB Master Plan 2021. Various development opportunities were identified by TNPA across three precincts namely South Dunes, Newark and Bayvue and are reflected in the PDFP and the PoRB Master Plan 2021 – 2035.

The Berth 605 project area is located within the Bayvue Precinct of the PoRB and identified as Project 1. The precinct is situated on the northern side of the port, between Alusaf aluminium smelter in the west, Thulazihleka pan in the north and Tuzi-gazi in the east. Effectively the precinct accommodates dry bulk, break bulk and liquid bulk terminals which include significant road, rail, building and services infrastructure. Cumulative impacts therefore need to take the master plan and the other precincts into consideration for accuracy.

The cumulative impacts of the project are therefore potentially significant. It is therefore recommended that the footprint avoids all undisturbed very high and high SEI habitat described in the preceding sections. This is necessary to prevent increased cumulative losses of SCC animal and plant species as well as protected Estuarine habitat. An updated Biodiversity Management plan and AIS Management Plan is also key to address the proposed Berth 605 footprint.

In the case of the project proceeding though the very high and high sensitivity areas (including estuarine habitats) a BOP is required. In line with the guideline a 30:1 offset ratio is recommended as a starting point. However, the extent and quanta required to address the negative residual impact could be negotiated with the relevant authority and Ezemvelo Wildlife.

7. CONCLUSION

The purpose of the terrestrial ecological study was to establish a baseline of the current ecological state of the environment potentially affected by the developmental activities based on a review and consolidation of existing data for the area and supplemented by targeted field sampling. This baseline assessment then informed a detailed assessment of potential impacts to identified sensitive terrestrial biodiversity receptors. The baseline assessment confirmed the presence of high and very high sensitivity habitats and the confirmed presence and high likelihood of occurrence of numerous faunal and floral SCCs. In addition, natural habitat remains that is confirmed to be CBA1: Irreplaceable. The project will lead to impact on these sensitive receptors and impacts are anticipated to include:

- Direct impacts through clearing of land and resultant loss of biodiversity (flora and fauna SCC) as well as ecosystems of concern.
- Establishment and spread of alien and invasive species.
- Loss and fragmentation of faunal habitats.

Mitigation measures have been recommended to minimise impacts to medium and low SEI habitats, and to avoid or counteract impacts to faunal and floral SCCs. These must be implemented in full.

The most significant impacts, however, are associated the dredging footprint which will result in the permanent loss of plant and animal species of concern, grassland habitat of Medium SEI, coastal forest habitat of High SEI, *Bruguiera gymnorhiza* mangrove forests of Very High SEI. These areas are also natural habitat that has been confirmed to be CBA1: Irreplaceable. The loss of this habitat cannot be avoided, minimised further or rehabilitated, and therefore the only remaining option available according to the mitigation hierarchy to ensure no net loss of biodiversity, which is required to avoid a fatal flaw to the project, is to develop and implement a biodiversity offset plan to counterbalance the loss of important biodiversity and ecological processes. A temporary stockpile area will also lead to loss of grassland habitat of Medium SEI. However, it is possible to rehabilitate this footprint following construction and therefore, if rehabilitated effectively back to the preconstruction integrity, no offset should be required to address this temporary loss for the temporary stockpile.

Therefore, in line with the mitigation hierarchy and the National Biodiversity Offset Guideline (Government Gazette 48841 (Notice No. 3569)) (DFFE, 2023), a Biodiversity Offset Plan (BOP) is required to address these significant terrestrial residual impacts. Due to the sensitivity of the habitat and SCC occurring, a 30:1 offset ratio is the starting point as per the guideline. However, this ratio could be lowered on consultation with the DFFE and Ezemvelo/ KZN Wildlife and based on the site-specific situation. The biodiversity offset should consider the current operational footprint and proposed new berth 605 footprint and temporary stockpiles.

Additionally, the Estuarine and Marine Ecology Specialist Study compiled by the CSIR (2024) concluded that *“the most ecologically sensitive and important habitat in the Berth 605 Project footprint is the small tidally influenced pool inland of the Assembly Basin. The pool is fringed by mangrove trees, including black mangrove, a protected tree in terms of the National Forestry Act. There is a high diversity and abundance of fish and pelagic and benthic invertebrates in the pool. This area will be affected by the proposed development, and therefore it is envisaged that an estuarine biodiversity offset will need to cater for impacts to the estuarine ecosystems.*

7.1. SPECIALIST OPINION

In accordance with the outcomes of the impact assessment and taking cognisance of the baseline conditions, as well as the impact avoidance, mitigation and management measures outlined herein, and strictly subject to the development of an approved terrestrial biodiversity offsetting strategy in the event that the proposed Project layout cannot be revised to avoid impacting natural grasslands and forests as well as their associated species of conservation concern, the proposed Project can be considered for authorisation.

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