

CRUZ ENVIRONMENTAL

Investigational Report No. 45

Proposed Upgrade of Transnet Heliport and associated Infrastructure, Port of Richards Bay, KZN: Aquatic and Terrestrial Biodiversity Assessment of the Current Site.



A report prepared for Nsovo Environmental Consulting

by

DP CYRUS *Pr.Sci.Nat.*

July 2022

CRUZ-E CRUZ Environmental
Registration No. CK 2008/084180/23

P.O.Box 357
Empangeni,
3880
Cell: 082-455 9197
Tel: 035-772 1997
e-mail:

CRUZ-E@planetcoms.co.za
or cyrus@iafrica.com

REPORT STATUS

DATE:	JULY 2022
REPORT TITLE:	Proposed Upgrade of Heliport Infrastructure, Port of Richards Bay: Aquatic and Terrestrial Biodiversity Assessment of the Current Site.
REPORT VERSION:	V1
REPORT REFERENCE:	CRUZ-E Investigational Report No. 45
CLIENT:	Nsovo Environmental Consulting
CLIENT REFERENCE:	Investigational Report No.45
AUTHOR:	Prof DP Cyrus <i>Pr.Sci.Nat (Ecological Sciences)</i> Registration Number 138060

COPYRIGHT: Any reproduction, duplication and copying of any section of this report must be authorized in writing by CRUZ-E. No part of this report may be reproduced without full acknowledgement of the source.

CITATION: For bibliographic purposes this report should be cited as:

Cyrus. D.P. 2022. Proposed Upgrade of Heliport Infrastructure, Port of Richards Bay: Aquatic and Terrestrial Biodiversity Assessment of the Current Site. *CRUZ Environmental Report*, **No. 45**: 1-22.

This report has been prepared for Nsovo Environmental Consulting.

DECLARATION BY THE SPECIALIST

I, Prof Digby Paul Cyrus, declare that;

- I act as the independent specialist on this report;
- I have performed the work relating to the report in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the work for this report, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I have complied with the Act, Regulations and all other applicable legislation;
- I have no, and have not engaged in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing
 - any decision to be taken with respect to the application by the competent authority;
 - and
 - the objectivity of any report, plan or document prepared by me for submission to the competent authority;
- all the particulars furnished by me are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.



Signature of the Specialist

CRUZ Environmental cc

Name of Company:

14th of October 2022

Date

TABLE OF CONTENTS

1. INTRODUCTION	1
1.1 BACKGROUND TO THIS PROJECT	1
1.2 PROJECT BRIEF AND STUDY SITE	2
2. FIELD WORK AND SAMPLE ASSESSMENT	4
2.1 FIELD WORK	4
2.2 SAMPLE ASSESSMENT	5
3. AQUATIC BIODIVERSITY ASSESSMENT	5
3.1 AQUATIC HABITATS PRESENT ON SITE	5
3.2 AQUATIC SPECIES PRESENT ON SITE	5
3.3 DISCUSSION AND CONCLUSIONS	9
4. TERRESTRIAL BIODIVERSITY ASSESSMENT	10
4.1 TERRESTRIAL HABITATS PRESENT ON SITE	10
4.2 FLORA RECORDED ON THE SITE	11
4.3 FAUNA RECORDED ON THE SITE	13
4.3.1 Lepidoptera (Butterflies)	13
4.3.2 Other Invertebrates	13
4.3.3 Avifauna (Birds)	13
4.3.4 Mammals	13
4.4 DISCUSSION AND CONCLUSIONS	14
5. IMPACT ASSESSMENTS	15
5.1 SUMMARY OF THE POSITIVE AND NEGATIVE IMPACTS AND RISKS OF THE PROPOSED ACTIVITY AND IDENTIFIED ALTERNATIVES.	15
5.1.1 Impacts on Terrestrial Biodiversity (Flora)	15
5.1.2 Impacts on Terrestrial Biodiversity (Fauna, including Avifauna)	16
5.1.3 Impacts on Aquatic (Freshwater) Biodiversity	17
6. OVERALL DISCUSSION AND CONCLUSIONS	18
7. REFERENCES	19
ABREVIATED CURRICULUM VITAE: PROF. DIGBY PAUL CYRUS	21

LIST OF FIGURES

Figure 1.1	Position of Transnet Heliport with insert showing demarcation of study site for this project (Figure provided by Nsovo Environmental Consulting).	1
Figure 1.2	The current Heliport facility on the edge of the Richards Bay Estuary which is only able to accommodate two helicopters.	2
Figure 1.3	From right to left, Helicopter on Heliport landing platform, hanger and workshop containing second helicopter, refuelling tanker and administration building.	3
Figure 1.4	Car Park behind administration building and next to Helicopter hanger and workshop.	3
Figure 1.5	Boundary of Study Site for Transnet Heliport Infrastructure Upgrade based on co-ordinates provided by Nsovo Environmental Consulting as detailed in the text box in the bottom right-hand corner of Figure 1.1.	4
Figure 3.1	Aquatic Habitats present on study site are small Ephemeral Pans within Blue Boundary, whilst the Blue Arrow indicates exit route of water/ground water from the pans to the Richards Bay Estuary.	6
Figure 3.2	View of the Ephemeral Pans on the Heliport site.	7
Figure 3.3	Outflow of water from the Ephemeral Pans on the Heliport site.	7
Figure 3.4	Male Swamp Bluet (<i>Africallagma glaucum</i>).	8
Figure 3.5	Male Swamp Bluet (<i>Africallagma glaucum</i>) clasping female behind the neck prior to copulation taking place in flight.	9
Figure 4.1	Threatened Vegetation on the study site.	11
Figure 4.2	Main floral areas on the site, designation of letters as detailed in the text above.	12
Figure 6.1	Revised boundaries for the proposed development of the new Heliport showing the extension into the Richards Bay Estuary (from Nsovo EC).	19

LIST OF TABLES

Table 3.1	Species of Odonata observed on the site.	8
Table 4.1	List of Trees, shrubs and flowering plants recorded on the study site (* = Exotic Species).	12
Table 4.2	List of Butterflies recorded on the study site.	13
Table 4.3	List of Bird species recorded on and in the vicinity of the study site (* = Exotic Species, # = Recorded Breeding on the Site).	14
Table 5.1	Impact Assessment on the Terrestrial Biodiversity (Flora).	15
Table 5.2	Impact Assessment on the Terrestrial Biodiversity (Fauna, including Avifauna).	16
Table 5.3	Impact Assessment on the Aquatic (Freshwater) Biodiversity.	17

1. INTRODUCTION

1.1 BACKGROUND TO THIS PROJECT

Transnet is planning to upgrade the Heliport at Richards Bay Harbour which is used to ferry the ship pilots to and from the incoming and outgoing vessels. The current Heliport is situated near the port exit channel opposite the Alkantstrand bathing beach as shown in Figure 1.1. It is currently only able to accommodate two helicopters and Transnet plan upgrade the facility so that it will be able to house three helicopters as well as having a 30,000 litres permanent storage facility for aviation fuel. Fuel is currently brought in by a tanker truck that is permanently based on site till it needs to refill. In order to provide the new facilities required there is a need to demolish and rebuild the entire facility. The current layout of the Heliport is shown in Figure 1.2 where it abuts onto the Richards Bay Estuary. Figures 1.3 and 1.4 provide an overview of the current infrastructure on the site.



Figure 1.1 Position of Transnet Heliport with insert showing demarcation of study site for this project (Figure provided by Nsovo Environmental Consulting).



Figure 1.2 The current Helipad facility on the edge of the Richards Bay Estuary which is only able to accommodate two helicopters.

1.2 PROJECT BRIEF AND STUDY SITE

CRUZ Environmental were approached by Nsovo Environmental Consulting to provide a quote for undertaking an Aquatic and Terrestrial Biodiversity study of the current Helipad site as well as a portion of land immediately to the North of the Helipad. This study area was to be based on the co-ordinates provided for the site boundary in the text box on the bottom right-hand corner of Figure 1.1. These co-ordinates have been plotted on Figure 1.5 to give a clear indication of the study site for the project.



Figure 1.3 From right to left, Helicopter on Heliport landing platform, hanger and workshop containing second helicopter, refuelling tanker and administration building.



Figure 1.4 Car Park behind administration building and next to Helicopter hanger and workshop.

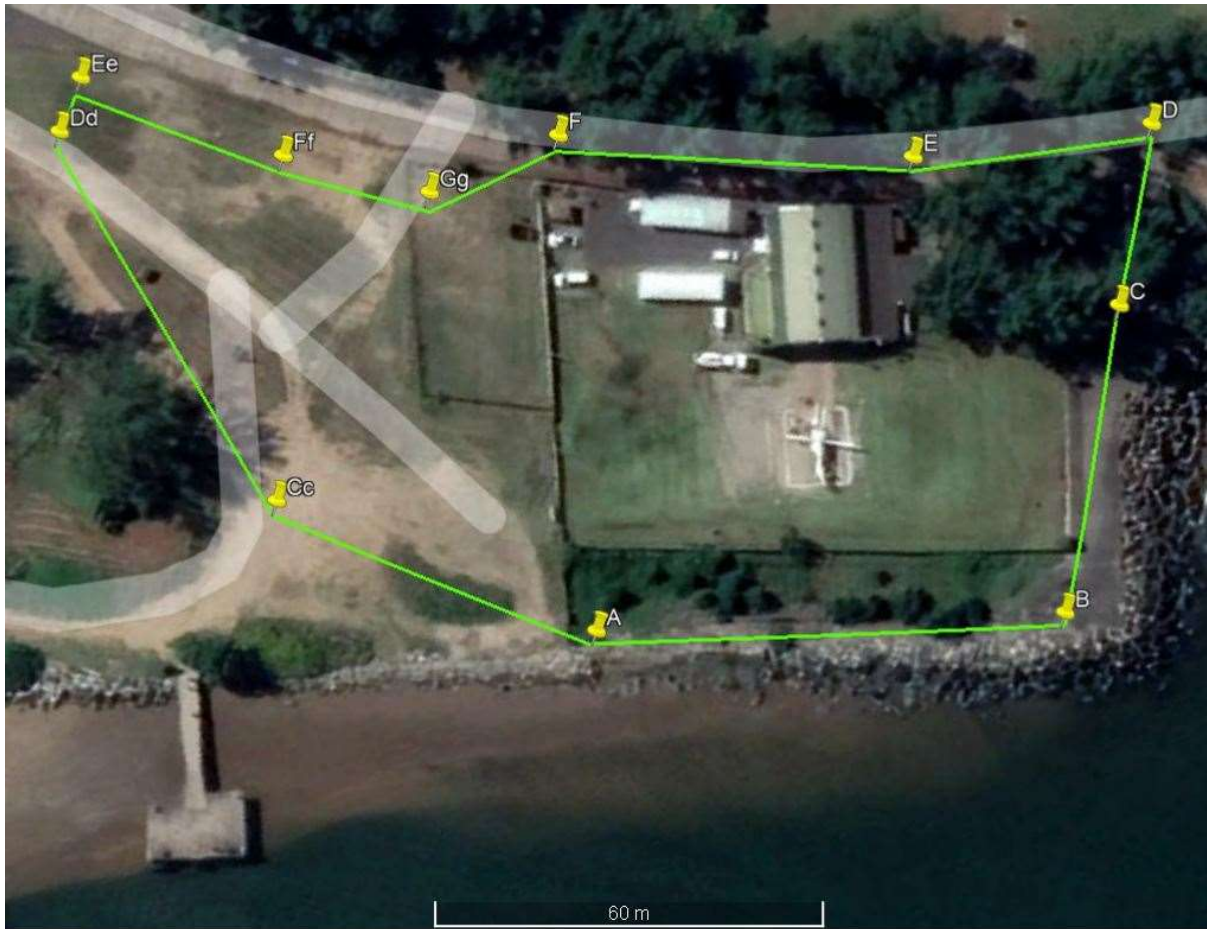


Figure 1.5 Boundary of Study Site for Transnet Heliport Infrastructure Upgrade based on coordinates provided by Nsovo Environmental Consulting as detailed in the text box in the bottom right-hand corner of Figure 1.1.

2. FIELD WORK AND SAMPLE ASSESSMENT

2.1 FIELD WORK

Fieldwork for the project was undertaken over the period of 23rd and 24th of May 2022. The methodology followed was to undertake an exploratory reconnaissance of the entire site followed by a detailed assessment of the flora present, at the same time noting any fauna on the site. This was then followed by a detailed period of observation across the entire site recording all faunal components observed. Time was also spent in discussion with the helicopter crew who perform 12 hour shifts on the site and were able to provide additional details relating to the fauna present. All identifiable species were recorded on site whilst specimens of unidentifiable flora present on the site were collected and taken back to the laboratory for identification.

2. 2 SAMPLE ASSESSMENT

Specimens of unidentifiable flora present on the site were taken back to the laboratory for identification. Details of unidentifiable fauna were recorded on site, and these were used to identify them in the relevant field guides. These guides included Pooley (1998) and Boon (1993) for Floral components, Woodhall (2005) for Butterflies (Lepidoptera), Tarboton and Tarboton (2009) for Dragonflies (Odonata: Anisoptera) and Tarboton and Tarboton (2005) for Damselflies (Odonata: Zygoptera)

3. AQUATIC BIODIVERSITY ASSESSMENT

Based on the on the fieldwork undertaken on the site the following information has been obtained regarding the Aquatic Biodiversity of the site.

3.1 AQUATIC HABITATS PRESENT

There are no permanent aquatic habitats present on the study site, however following rain events three or four small Ephemeral Pans are present on the northern side of the current Heliport property as was the case when the field assessment was undertaken for this study. These Ephemeral Pans appear to be present in some 35 to 40% of the historical photos currently on Google Earth and it can only be assumed that they are more of a summer phenomenon being present during the rainy season. The locality of these pans are indicated on Figure 3.1 (encircled in Blue), from them the water flows westwards towards the Richards Bay Estuary as indicated by the Blue Arrow. Figure 3.2 provides a general overview of the position of the pans on the Heliport. At some points along the flowline the water movement is obviously subsurface, however just outside the Heliport boundary fence where a concrete and rock sill has been constructed the water appears to come to the surface and then flows over the sill and into the estuary (Figure 3.3).

3.2 AQUATIC SPECIES PRESENT ON SITE

During the day and a half that was used to survey the site no aquatic fauna or stages of aquatic fauna were observed in the Ephemeral Pans. However, the adult flying forms of two species of Dragonflies (Odonata: Anisoptera) and one species of Damselfly (Odonata: Zygoptera) were observed around the pans (Table 3.1). Only one individual of each of the Dragonflies was noted, however, more than 25 individual Damselflies of the species *Africallagma glaucum*

(Swamp Bluet) Figure 3.4, were constantly flying over the Ephemeral Pans. It was also noted that the males were display flying, mating and then depositing eggs into the water.

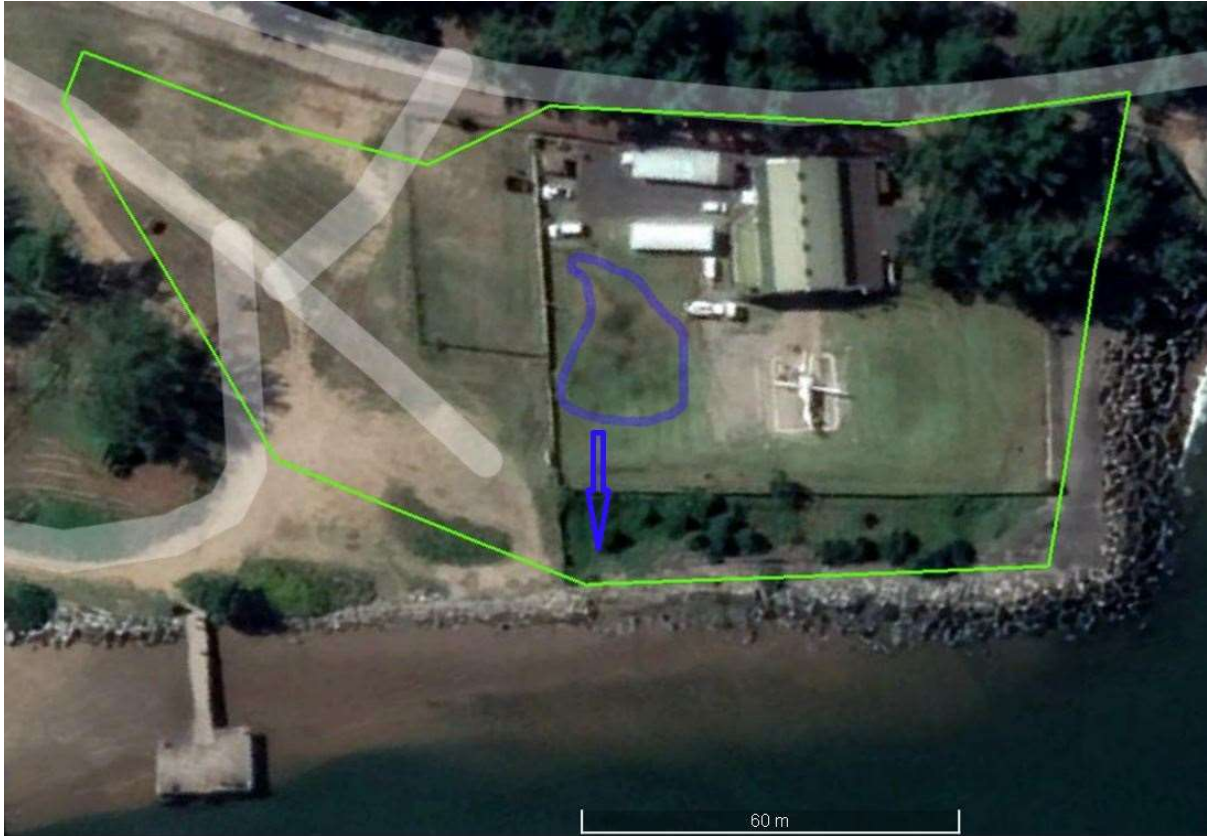


Figure 3.1 Aquatic Habitats present on study site are small Ephemeral Pans within Blue Boundary, whilst the Blue Arrow indicates exit route of water/ground water from the pans to the Richards Bay Estuary.



Figure 3.2 View of the Ephemeral Pans on the Heliport site.

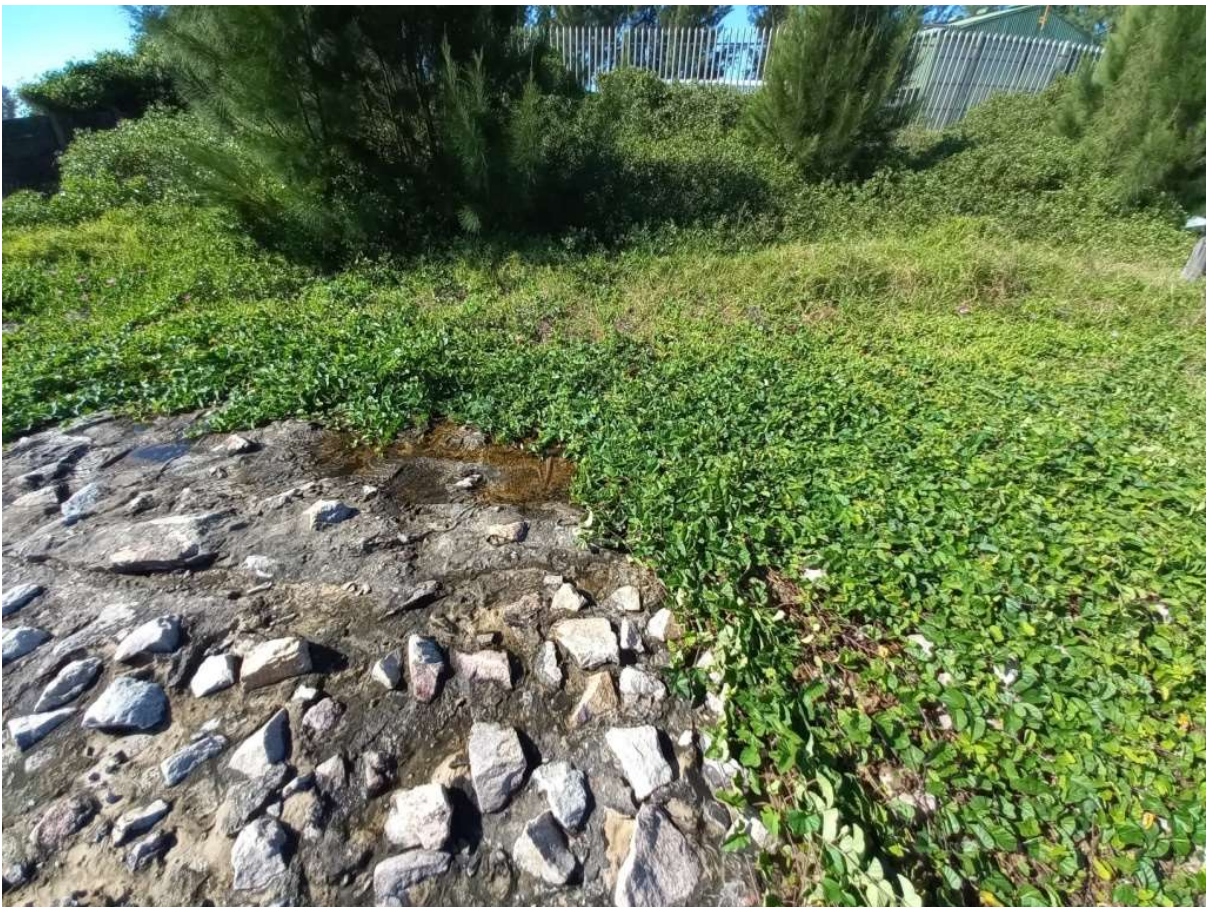


Figure 3.3 Outflow of water from the Ephemeral Pans on the Heliport site.

Table 3.1 Species of Odonata observed on the site.

No.	Scientific Name	Common Name
1	<i>Ictinogomphus forex</i> (Anisoptera)	Common Tigertail
2	<i>Rhyothemis semihyalina</i> (Anisoptera)	Phantom Flutterer
3	<i>Africallagma glaucum</i> (Zygoptera)	Swamp Bluet

During mating, the male Swamp Bluet clasps the female by her neck (Figure 3.5) and then she bends her body around to his reproductive organs for mating to take place, this is called a mating wheel. The pair flies together over the water and eggs are laid within a suitable plant, such as those seen in Figure 3.5, just below the water surface. The eggs hatch and the larvae, called nymphs, live in the water until they hatch into adults. During the entire period of the field assessment these Damselflies were busy mating and depositing eggs in the water.



Figure 3.4 Male Swamp Bluet (*Africallagma glaucum*).



Figure 3.5 Male Swamp Bluet (*Africallagma glaucum*) claspng female behind the neck prior to copulation taking place in flight.

3.3 DISCUSSION AND CONCLUSIONS

The Aquatic Biodiversity of the Helipad site is very low due to the total modification of the habit over time to form nothing more than an area of short, manicured grass. This contains some small depressions which accumulate and hold water for periods of time during the rainy season. The three aquatic associated species recorded on the site occur commonly on the Zululand Coastal Plain and elsewhere and are not considered endangered.

It is therefore concluded that the site is of Low Sensitivity in terms of Aquatic Biodiversity and whilst the proposed development will remove this habitat its loss will not be of significance in terms of the species populations.

4. TERRESTRIAL BIODIVERSITY ASSESSMENT

Based on the fieldwork undertaken the following information has been obtained regarding the Terrestrial Biodiversity of the site.

4.1 TERRESTRIAL HABITATS PRESENT ON SITE

Nsovo Environmental Consulting provided a map showing the threatened vegetation of the area (Figure 4.1). This shows that 75% of the site consisted of the threatened Kwambonambi Hygrophilous Grasslands, a habitat that contains several endemic Dragonflies and Mayflies (Odonata). It is almost certain that prior to Harbour construction and the modification of the estuary which took place the other 25% of the site also consisted of this threatened habitat.

However, post harbour construction finds the area on which the Heliport is situated consisting largely of short, manicured grass which is maintained as such to allow for safety requirements around the helicopter landing pad. Much of the other vegetation present is remnant Kwambonambi Dune Forest (Figure 4.1), which occurred adjacent to the grasslands that now also has a substantial number of exotic species present as well. The terrestrial habitat has been almost entirely modified from its original composition.

Currently the vegetation on the site can be divided into five zones designated from A to E as shown on Figure 4.2, these are as follows;

- A. Stand of tall exotic *Casuarina equisetifolio* trees with some *Stelitzia nicolai* around the periphery.
- B. Mixed coastal shrubs/small trees and exotic species, particularly *Casuarina equisetifolio*, in the buffer area between the current Heliport fence and the Richards Bay Estuary.
- C. Mixed coastal shrubs/small trees and exotic species growing along the fence line of the Heliport.
- D. Coastal shrubs/small trees with some exotic *Casuarina equisetifolio* trees interspersed.

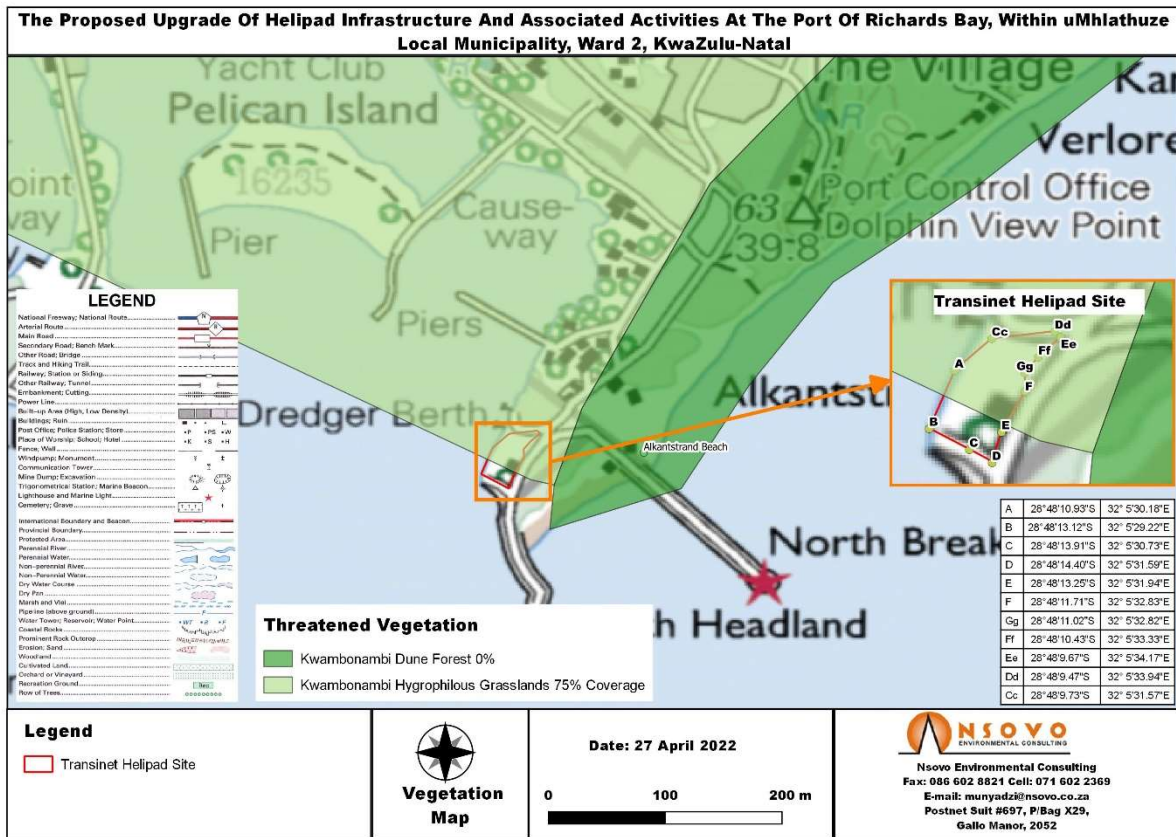


Figure 4.1 Threatened Vegetation on the study site.

4.2 FLORA RECORDED ON SITE

Several of the species present were identified on site however verification of these and the identification of the unidentified specimens that were brought back to the laboratory were undertaken using Boon (1993) and Pooley (1998). Based on the identifications obtained a total of 13 species of flora were found on the study site (Table 4.1), five of these are introduced exotic species.

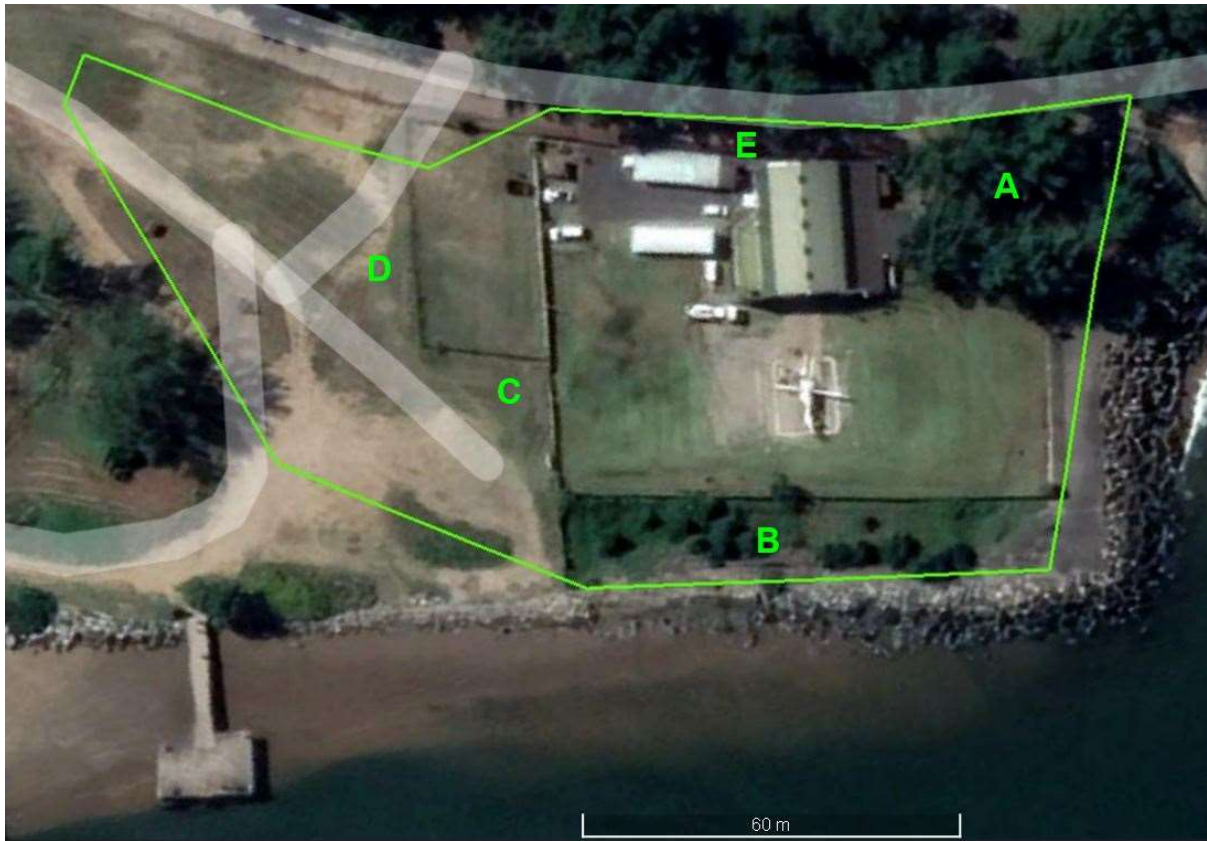


Figure 4.2 Main floral areas on the site, designation of letters as detailed in the text above.

Table 4.1 List of Trees, shrubs and flowering plants recorded on the study site (* = Exotic Species).

No.	Scientific Name	Common Name
1	<i>Brachylaena discolor</i>	Coastal Silver Oak
2	<i>Casuarina equisetifolio</i> *	Horsetail Tree
3	<i>Chromolaena odorata</i> *	Paraffin Weed
4	<i>Chrysanthemoides monilifera</i>	Bush Tick-berry
5	<i>Euglena capensis capensis</i>	Dune Myrtle
6	<i>Hydrocotyle bonariensis</i>	Largeleaf Penny Wort
7	<i>Lantana camara</i> *	Tickberry
8	<i>Rhoicissus tomentosa</i>	Common Forest Grape
9	<i>Rhoicissus tridentata</i>	Bushman's Grape
10	<i>Rhoicissus spp.</i> (Digitata in part)	Baboon Grape
11	<i>Schinus terebinthifolius</i> *	Brazilian Pepper Tree
12	<i>Solanum nigrum</i> *	Black Nightshade
13	<i>Stelitzia nicolai</i>	Natal Wild Banana

4.3 FAUNA RECORDED ON SITE

4.3.1 Lepidoptera (Butterflies)

During the field work for this project a total of 10 Butterfly species were identified on the study site, these are listed on Table 4.2. There were at least three or four other species present that moved too fast to be identified or to get sufficient details to be able to attempt identification.

Table 4.2 List of Butterflies recorded on the study site.

No.	Scientific Name	Common Name
1	<i>Belenois creona</i>	African Common White
2	<i>Charaxes varanes</i>	Pearl Emperor
3	<i>Colias electo</i>	African Clouded Yellow
4	<i>Dixeia pigea</i>	Small Ant-heap White
5	<i>Eurema brigitta</i>	Broad-bordered Grass Yellow
6	<i>Hypolimnas misippus</i>	Common Diadem
7	<i>Mylothris agathina</i>	Eastern Dotted Boarder
8	<i>Ooskus goue</i>	Natal Opal
9	<i>Papilio demodocus</i>	Citrus Swallowtail
10	<i>Precis octovia</i>	Gawdy Commodore

4.3.2 Other Invertebrates

Several other insect species were observed on the site, however it was not possible to collect them for identification. These included at least three species of grasshopper and several other fly and bug species.

4.3.3 Avifauna (Birds)

During the field work for this project a total of 16 Bird species were identified on or adjacent to the study site, they are listed on Table 4.3. Their identifications were confirmed using Sinclair *et. al.* (2020)

4.3.4 Mammals

Apart from Feral Cats (*Felis catus*), which were present around the Heliport site no other mammals were observed during the period that the fieldwork was undertaken. However, the Helicopter Crew confirmed that Vervet Monkey (*Chlorocebus pygerythrus*) and Slender Mongoose (*Galerella sanguinea*) have been seen on the site occasionally.

Table 4.3 List of Bird species recorded on and in the vicinity of the study site (* = Exotic Species, # = Recorded Breeding on the Site).

No.	Scientific Name	Common Name
1	<i>Acriditheres tristis</i> *	Common Myna
2	<i>Bycanistes bucinator</i>	Trumpeter Hornbill
3	<i>Chroicocephalus cirrocephalus</i>	Grey-headed Gull
4	<i>Haliaeetus vocifer</i>	Fish Eagle
5	<i>Hirundo smithii</i>	Wire-tailed Swallow
6	<i>Lanius collaris</i>	Common Fiscal
7	<i>Larus dominicanus</i>	Kelp Gull
8	<i>Lochura cuclata</i>	Bronze Mannikin
9	<i>Motacilla aguimp</i>	Pied Wagtail
10	<i>Onychognathus morio</i> #	Red-winged Starling
11	<i>Passer domesticus</i> *	European House Sparrow
12	<i>Ploceus cucullatus</i>	Village Weaver
13	<i>Ploceus ocularis</i>	Spectacled Weaver
14	<i>Pycnonotus tricolor</i>	Dark-capped Bulbul
15	<i>Streptopelia semitorquata</i>	Red-eyed Dove
16	<i>Trachyphonus vaillantii</i>	Crested Barbet

4.4 DISCUSSION AND CONCLUSIONS

The Terrestrial Biodiversity of the Helipad site is very low due to the total modification of the habitat over time to form nothing more than an area of short, manicured grass. Only commonly occurring trees and shrubs as well as several introduced species are present on the periphery of the Heliport site. The fauna recorded on and adjacent to the site is very limited and comprises commonly occurring species of the general area, none of which are endangered.

It is therefore concluded that the site is of Low Sensitivity in terms of Aquatic Biodiversity and whilst the proposed development will remove the majority of the habitat present its loss will not be of significance in terms of the species populations.

5. IMPACT ASSESSMENTS

5.1 SUMMARY OF THE POSITIVE AND NEGATIVE IMPACTS AND RISKS OF THE PROPOSED ACTIVITY AND IDENTIFIED ALTERNATIVES.

5.1.1 Impacts on Terrestrial Biodiversity (Flora)

Note: This assessment covers only the currently occupied site of the Heliport and a small section to the North as indicated in Figure 1.5.

Table 5.1 Impact Assessment on the Terrestrial Biodiversity (Flora).

	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
There will be an almost total loss of all vegetation on the site during the duration of the project. However, the biodiversity assessment indicated that the bulk of species present are aliens and those indigenous species present are by and large all common throughout the local area.							
Construction Closure Phase							
Flora	No	Negative	1 (Local)	2 (Medium term)	6 (Moderate)	5 (Definite)	45 (Medium)
	Yes	Negative	1 (Local)	1 (Medium term)	4 (Low)	5 (Definite)	30 (Low)
A loss of ecological processes associated with the loss of intact vegetation will occur, however there are few ecologically important species, and no species of conservation concern are present on the site.							
Construction Phase							
	No	Negative	1 (Local)	2 (Medium term)	6 (Moderate)	5 (Definite)	45 (Medium)
	Yes	Negative	1 (Local)	1 (Short term)	4 (Low)	5 (Definite)	30 (Low)
Mitigation Measures							
<ul style="list-style-type: none"> • Immediate rehabilitation of any areas disturbed as a result of construction activities. Use indigenous species that are specific to the original vegetation type of the affected area (ensure to keep top soil separate); • Removal of all exotic vegetation, including trees; • Ensure that that any intact indigenous vegetation not being affected during the redevelopment of the site is temporarily fenced off; and • Rubble and waste should not be dumped in natural areas where natural vegetation is present. 							

5.1.2 Impacts on Terrestrial Biodiversity (Fauna, including Avifauna)

Note: This assessment covers only the currently occupied site of the Heliport and a small section to the North as indicated in Figure 1.5.

Table 5.2 Impact Assessment on the Terrestrial Biodiversity (Fauna, including Avifauna).

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<p>There will be an almost total loss of habitat for both terrestrial fauna and avifauna from the site during the duration of the project. However, the biodiversity assessment indicated that there is virtually no terrestrial fauna currently present on the site. Those observed were transient, visiting from the greater Alkant Strand area, none are ecologically important, and no species of conservation concern are present on the site. In terms of avifauna, none are ecologically important, and no species of conservation concern are present on the site. Red-winged Starling, the only bird species recorded breeding on the site, utilized a man-made structure (the hanger) and would probably do so again once the new site was fully developed.</p>							
Construction Closure Phase							
Flora	No	Negative	1 (Local)	2 (Medium term)	6 (Moderate)	5 (Definite)	45 (Medium)
	Yes	Negative	1 (Local)	1 (Medium term)	4 (Low)	5 (Definite)	30 (Low)
<p>A loss of ecological processes associated with the loss of intact vegetation will occur, however there are few ecologically important species and no species of conservation concern present on the site.</p>							
Construction Phase							
	No	Negative	1 (Local)	2 (Medium term)	6 (Moderate)	5 (Definite)	45 (Medium)
	Yes	Negative	1 (Local)	1 (Short term)	4 (Low)	5 (Definite)	30 (Low)
Mitigation Measures							
<ul style="list-style-type: none"> • Immediate rehabilitation of any areas disturbed as a result of construction activities will allow the area to be once again utilised by transient terrestrial species and avifauna. Use indigenous species that are specific to the original vegetation type of the affected area (ensure to keep top soil separate). • Removal of all exotic vegetation, including trees would enhance the potential for limited terrestrial and avian biodiversity recolonization. 							

5.1.3 Impacts on Aquatic (Freshwater) Biodiversity

Note: This assessment covers only the currently occupied site of the Heliport and a small section to the North as indicated in Figure 1.5. This Impact Assessment and the above Specialist Report do not include any assessment of impacts related to the adjacent Estuarine Environment which will be impacted by the extension of the Helipad Landing Platform over the intertidal area.

Table 5.3 Impact Assessment on the Aquatic (Freshwater) Biodiversity.

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<p>There will be a total loss current non-perennial freshwater habitat on the site. However, the aquatic (freshwater) biodiversity assessment indicated that their area of habitat is extremely small, is only present due to the undulating nature of the site when it was levelled and that only three species (all of which are common) are present. Those present, although utilising the small, shallow pools of freshwater were not ecologically important, and no species of conservation concern are present on the site. It is considered that these small patches of freshwater non-perennial habits serve no real ecological function.</p>							
Construction Closure Phase							
Flora	No	Negative	1 (Local)	2 (Medium term)	6 (Moderate)	5 (Definite)	45 (Medium)
	Yes	Negative	1 (Local)	1 (Medium term)	4 (Low)	5 (Definite)	30 (Low)
<p>A loss of ecological processes associated with the loss of the current seasonally filled depressions will occur, however there are no ecologically important species and no species of conservation concern present on the site.</p>							
Construction Phase							
	No	Negative	1 (Local)	2 (Medium term)	6 (Moderate)	5 (Definite)	45 (Medium)
	Yes	Negative	1 (Local)	1 (Short term)	4 (Low)	5 (Definite)	30 (Low)
Mitigation Measures							
<ul style="list-style-type: none"> There is no reason to rehabilitate the non-perennial pools as they do not serve a major ecological function. 							

6. OVERALL DISCUSSION AND CONCLUSIONS

The current state of the habitat on the Heliport site (Figure 1.5) is that of a highly modified environment comprising predominantly a manicured lawn. This coupled with the data collected during the fieldwork undertaken, which showed that there are no significant/important species present, indicates that the site does not warrant being classified as having a “Very High Sensitivity Rating”. This is based on the directives for Site Sensitivity Verification as per the Gazetted Protocols for the Specialist Assessment for Environmental Impacts on both Aquatic and Terrestrial Biodiversity (Government Gazette No.43110 dated 20th March 2020). Rather it is concluded that both the Aquatic and Terrestrial Biodiversity of the site indicate that it has a “Low Sensitivity Rating”.

The Impacts Assessments undertaken for the current Heliport area plus a small section to the North, as shown in Figure 1.5) indicate that for this area all impacts will be at a Medium Level and that these will drop to Low with Corrective Measures (Mitigation) as indicated in the Impact Assessment Tables.

Based on the above, this report concludes that whilst the proposed upgrade of the Heliport infrastructure within the current boundaries will modify the entire habitat of the site, this will not be of significance in terms of the fauna and flora populations of the general area. It is thus recommended that from a natural environmental perspective the development the proposed infrastructure upgrade of the Heliport within the demarcated boundary as shown in Figure 1.3 can go ahead.

Subsequent to this study being initiated and fieldwork completed, a revised boundary for the Heliport development was received from Nsovo (Figure 6.1). The site to be developed has been extended to the East and now impinges on a section of the intertidal habitat of Richards Bay Estuary. Co-ordinate points a to d on the insert box in Figure 6.1 indicate the area within which this will take place. Furthermore, from details provided of the proposed structural developments in the estuarine area there will be some permanent loss of some intertidal habitat. This additional section, which would require an Estuarine Biodiversity and Impact Assessment was not part of the present study.

An extension into the estuarine environment would also trigger several additional listed activities as per the Environmental Impact Assessment Regulations Listing Notices 1 and 2 (Government Gazette No.38282 dated 4th December 2014) as well as 3 (Government Gazette No.33306 dated 18th June 2014). Identified activities in these Listing Notices would require

environmental authorisation prior to commencement of the Heliport infrastructure upgrade taking place. In order to obtain such authorization an assessment of the environmental state and potential impacts of the identified triggers on the affected environment would be required. For this a separate Estuarine Biodiversity and Impact Assessment study would need to be undertaken.

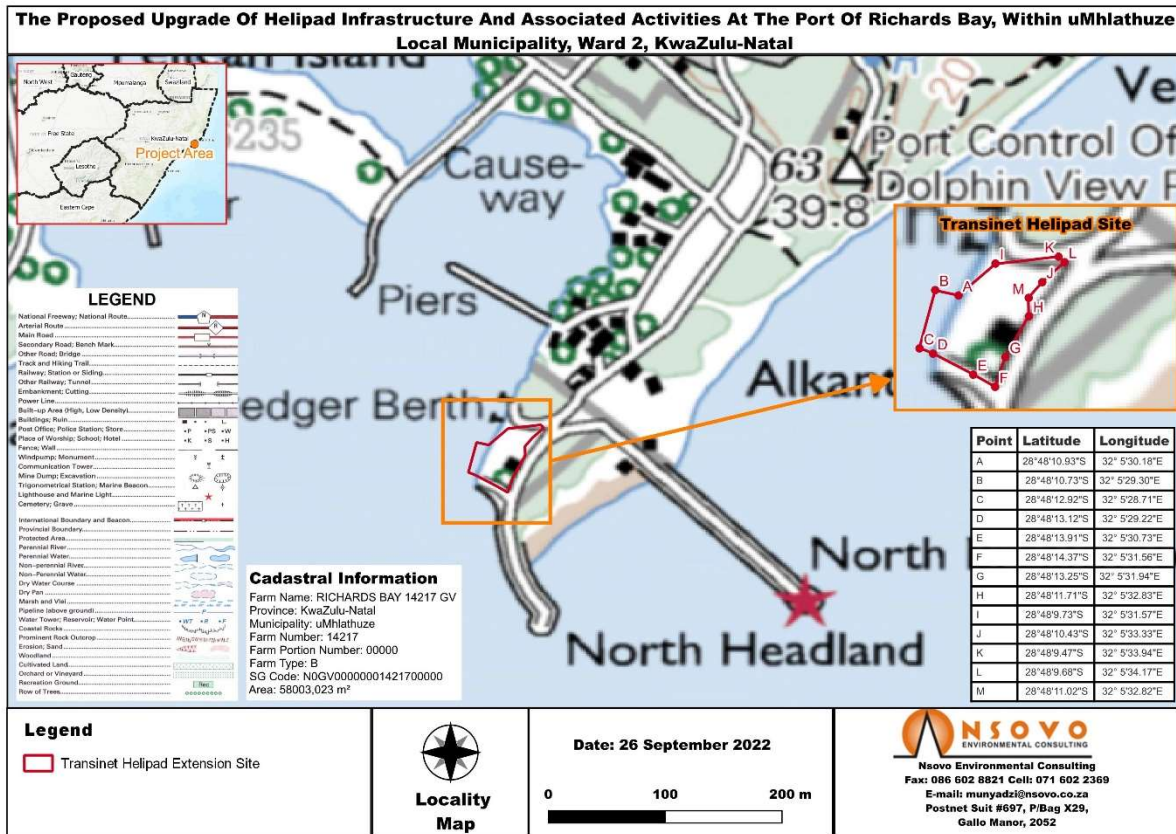


Figure 6.1 Revised boundaries for the proposed development of the new Heliport showing the extension into the Richards Bay Estuary (from Nsovo EC).

7. REFERENCES

- Boon, R. 1993. Pooley's Trees of Eastern South Africa, a complete guide. Flora and Fauna Publications Trust, Durban. 624 pages.
- Pooley, E. 1998. A Field Guide to Wild Flowers of KwaZulu-Natal and the Eastern Region. Natal Flora Publications Trust, Durban. 630 pages.

- Sinclair, I., Hockey, P., Tarboton, W., Perrins, N., Rollinson, D. and Ryan, P. 2020. SASPL Birds of Southern Africa. Struik Nature, Cape Town. 488 pages.
- Tarboton, W. and Tarboton. M. 2005. A guide to the Damselflies of South Africa. Privately Published by the Authors, Modimolle. 95 pages.
- Tarboton, W. and Tarboton. M. 2009. A quick guide to the Dragonflies of South Africa. Privately Published by the Authors, Modimolle. 12 pages.
- Woodhall, S. 2005. Field Guide to the Butterflies of South Africa. Struik Nature, Cape Town. 440 pages.

ABREVIATED CURRICULUM VITAE
PROF. DIGBY PAUL CYRUS

Occupation:	Senior Academic, Estuarine Ecologist & Principal Environmental Scientist	
Position:	Head: Department of Zoology (1995 to June 2014) Research Fellow (July 2014 to 2018)	
Organisation:	Department of Zoology, University of Zululand	
Position:	Independent Environmental Consultant (1995 to date)	
Organisation:	CRUZ Environmental cc (Registration No. CK 2008/084180/23)	
Qualifications:	BSc (Zoology, Entomology)	1977
	BSc Hons (Hydrobiology)	1978
	MSc (<i>cum laude</i>) (Estuarine Ecology)	1980
	PhD (Estuarine Ecology)	1984
SACNASP	Registered Pr.Sci.Nat. (Ecological Sciences) [Registration No.138060]	
Awards	Southern African Society of Aquatic Scientists – <u>Gold Medal</u>	2011

Academic Experience: Thirty-four years' experience lecturing a wide range of Zoology related subjects as well as supervising numerous MSc and PhD students.

Research Experience: Forty-four year's covering Estuarine, River, near-shore Marine and Coastal Lake Environments.

Specialisations: Estuarine, River and Coastal Lakes Ecology. Flow Allocations for Environmental Purposes for Estuaries and Rivers based on Biotic component requirements. Fish Specialist. Also, specialist in ornithological issues related to association of birds with Estuaries, Rivers and Coastal Lakes.

Environmentally Related Activities: Have been involved in over 140 research projects concerned with Environmental Impact Assessments on the ecology of nearshore marine, estuarine and freshwater systems and project leader/senior author on some 95 of these. They include, assessment of the Environmental Impacts of the development of the Port of Richards Bay over the next 40 years and impacts of Dredging and Dredge Spoil Disposal and Impacts of Proposed Gas to Power Plant in Richards Bay on the Estuarine Environment. Currently working on developing and Estuarine Management Plan for the iLuvo Estuary and impact of a proposed Sand Mine of the uThongathi Estuary.

Presentation of Research Findings:	Publications:	Conference Presentations:
	155 Scientific Journal Publications (133 on Estuaries & 22 on Birds) 167 Environmental Project Reports (Mainly on Estuarine Environments)	81 National Conferences 73 International Conferences

Co-operative and Collaborative Research:

Current and past involvement with the Universities of Natal (Durban & Pietermaritzburg) and NMMU, the SA Institute for Aquatic Biodiversity, Ezemvelo KZN Wildlife, World Wildlife Fund - Conservation Division, National Ports Authority, Mondi Forests, Sappi Stanger, CSIR, Institute for Natural Resources, Oceanographic Research Institute as well as three overseas based projects (University of Hull, UK & CSIRO, Australia).

2022-07-16