

## Guide

This website will eventually contain over 350 field notes as well as over 50 desk notes, debates, discussions and appendices on a variety of features and natural processes in different locations within the Study Area. For ease of navigation in the site, the notes have been installed in twenty-seven chapters. In every chapter the notes were grouped in sections, according to certain subjects. The site is continuously populated, and notes are added from time to time.

The first six chapters (A to F) are general and of introductory contents. The order of the next twelve chapters (G to R) is, generally, the geographical order, from the west (Cape Agulhas) to the east (Cape Infanta), of the subjects. Chapter S is about the area (Rûens) north of the Hard Dunes. Chapters T to V are about the coastal area and the adjacent sea. Chapter W contains debates and discussions on various subjects, followed by two chapters of appendices, which contain notes (some of which are archival) about the fauna and flora (X) and about other subjects (Y) of the Study Area. Chapter Z contains bibliography lists and information sources. An additional Chapter Z brings photographs of all the features which were described and discussed in the website. On the Home Page it has its own button.

When readers click the 'Chapters' button, a list of all the chapters on the website will come up. Click on a Chapter to find the subject you want to read about. The following is a breakdown of the chapters into sections and into individual notes (only highlighted note are available):

### A. INTRODUCTION

1. Geography
2. Geology
3. Morphology
4. Hydrology
5. Archaeology

### B. NATURE RESERVES

1. Overview
2. Public nature reserves
  - a. De Mond Nature Reserve
  - b. Soetendals Vlei Nature Reserve
  - c. Waenhuiskrans Nature Reserve
  - d. Heuninberg Nature Reserve
  - e. De Hoop Nature Reserve and Marine Protected Area
3. Private nature reserves
  - a. Andrewsfield Nature Reserve
  - b. Heunings River Nature Reserve
  - c. Ancient Milkwood Tree (National monument)
  - d. Vogel Rivier Nature Reserve
  - e. Haarwegskloof Renosterveld Reserve
  - f. Hasekraal Nature Reserve
  - g. San Sebastian Nature Reserve
4. Denel Overberg Test Range
5. Bredasdorp Shipwreck Museum

### C. GEOLOGY

1. Overview
2. Table Mountain Group
  - a. Overview
  - b. Agulhas Outcrops
  - c. Bredasdorp Outcrops
    1. Heuninberg Mountain
    2. Zandfontein Quarries
    3. Muurkraal (on Nachtwacht Farm)
  - d. Arniston Outcrops

1. Meulvlei Ridge
2. Struis Point
- e. Potberg Outcrops
  1. Potberg Mountain
  2. Cape Infanta
  3. Potberg Estates
- f. Luiperdsberg outcrops
3. Bokkeveld Group - see Chapter S
4. Quartz veins - see Chapter S
5. Clays - see Chapter S
6. Enon Formation
  - a. Soutpansvlakte Basin
  - b. Salt River and De Hoop Vlei Gorges
  - c. Deposits
  - d. Clasts
  - e. Subsurface geology
7. Gravel terraces
  - a. North of the Hard Dunes
  - b. Along the Breede River
  - c. Other gravel terraces
8. Grahamstown Formation
  - a. Silcretes and ferricretes – Overview - see Chapter D
  - b. Field Notes on silcrete and ferricrete - see Chapter D
  - c. Hilltop silcretes spatial distribution - see Chapter D
9. Robberg Formation
10. Bredasdorp Group
  - a. Overview
  - b. De Hoop Vlei Formation
  - c. Wankoe Formation
    1. Calcified dunes ('Hard Dunes')
    2. Calcified dunes morphology
    3. Uncalcified dunes ('Soft Dunes')
    4. Hard Dunes – TMG Fms contacts
      - a. Potberg area
      - b. Infanta area
    5. Hard Dunes – Bokkeveld Fms contacts
      - a. Bredasdorp area
      - b. Rhenosterfontein Saddle
      - c. Soutpansvlakte to Potberg
  - d. Klein Brak Formation
    1. Cape Agulhas shore
    2. Arniston shore
    3. De Hoop Nature Reserve shore
    4. Infanta shore
  - e. Waenhuiskrans Formation
    1. Overview
    2. Ridges and features
      - a. Cape Agulhas
      - b. Struis Bay to Arniston
      - c. Arniston
      - d. OTR
      - e. De Hoop Nature Reserve
      - f. More formations in the Bredasdorp Group?
    3. Calcrete-capped dunes
    4. Klipfontein depression

- D. DURICRUSTS – CALCRETE, SILCRETE AND FERRICRETE
1. Pedocretes - Overview
  2. Calcretes - Overview
    - a. Calcrete on the Bokkeveld Formations
    - b. Calcrete on the Enon Formation
    - c. Calcrete on the Bredasdorp Group Formations
      1. Overview
      2. Wankoe Formation 'Hard Dunes'
      3. Wankoe Formation 'Soft Dunes'
      4. Waenhuiskrans Formation
    - d. Calcrete on the Bredasdorp Plain
    - e. Calcrete in the Ou Werf Valley
    - f. Calcrete root tubules
    - g. Calcrete as conglomerate cement
    - h. Calcrete dissolution features
    - i. Calcrete spatial distribution
  3. Silcretes and ferricretes – Overview
  4. Silcretes
    - a1. Pedogenic silcretes – A. Occurrences (outcrops) – Overview
    - a2. Pedogenic silcretes – B. Capped elevations
    - a3. Pedogenic silcretes – C. Hill cap habits
    - a4. Pedogenic silcretes – D. Multi-habit caps
    - a5. Pedogenic silcretes – E. Hilltop boulders
    - a6. Pedogenic silcretes – F. Hillslope boulders
    - a7. Pedogenic silcretes – G. Hilltop castles
    - a8. Pedogenic silcretes – H. Hillslope castles and other features
    - a9. Pedogenic silcretes – I. Hilltop silicified shale castles
    - a10. Pedogenic silcretes – J. Hillslope silicified shale features
    - a11. Pedogenic silcretes – K. Textures
    - a12. Pedogenic silcretes – J. Disintegration and weathering
    - a13. Pedogenic silcretes – L. Silicification of other rocks
    - c1. Pedogenic silcretes – Hilltop silcretes spatial distribution
    - d. Use of silcretes in the Stone Age - see Chapter S
    - e. Non pedogenic silcretes – A. Ground water
    - f. Non pedogenic silcretes – B. Drainage-lines and rivers
    - g. Non pedogenic silcretes – C. Lakes and pans
  5. Ferricretes
    - a. Pedogenic and non-pedogenic ferricretes
    - b. Ferruginised silcretes
    - c. Ferruginised shales and sandstones
    - d. Fault zone ferruginised shales
    - e. Manganese in ferruginised shales
    - f. Ferricrete spatial distribution
  6. Duricrusts in adjacent areas
    - a. Elim silcretes and ferricretes
    - b. Napier silcretes and ferricretes
    - c. Breede River gravel terraces ferricretes
    - d. Gourikwa silicified sandstones
    - e. Caledon silicified sandstones
    - f. Kleinmond silicified sandstones
    - f. Grabouw silicified sandstones
    - g. Oceanview silicified sandstones
  7. Pedocretes landscape field guides
    - a. Calcretised landscape – a field guide
    - b. Silcretised landscape – a field guide
    - c. Ferricretised landscape – a field guide

E. KARST LANDFORMS

1. Overview
2. Wankoe Formation - dry valleys
3. Wankoe Formation - dolines
  - a. Northwest province
  - b. Southwest province
  - c. Southeast province
  - d. Northeast province
4. Wankoe Formation – Other karst features
5.
  - a. Caves
  - b. Overhangs
  - c. Tubes
  - d. Pipes
  - e. Fluting
6. Wankoe Formation – Karst pinnacles
  - a. Overview
  - b. Pinnacles in the Salt River Gorge
  - c. Pinnacles on the East Hard Dunes
  - d. Pinnacles outside the Study Area
7. Waenhuiskrans Formation
  - a. Karst pinnacles – see chapter U
  - b. Karst pipes – see chapter U

F. TECTONICS

1. Overview
2. Morpho-tectonic evidence

G. CAPE AGULHAS AND STRUIS BAY

1. Geography
2. Morphology
3. Geology
4. Archaeology - see Chapter U (fish traps)

H. BREDASDORP PAIN

1. Geography
2. Morphology
3. Geology
4. Hydrology
  - a. Rivers and lakes
  - b. Floods
  - c. Flood control

I. HEUNINGS AND KARS RIVERS

1. Geography
2. Heunings River
3. Heunings River Estuary
4. Kars River
5. Kars River Gorge
  - a. Morphology
  - b. Geology
  - c. Tectonics
  - d. Archaeology
6. Hydrology

J. WEST HARD DUNES

1. Outer Hard Dunes
  - a. Morphology

- b. Geology
- c. Karst landforms
- 2. Inner Hard Dunes
  - a. Morphology
  - b. Geology
  - c. Karst landforms
  
- K. WEST VALLEYS
  - 1. Overview
  - 2. West Renoster Valley
  - 3. East Renoster Valley
  - 4. Rietfontein Valley
  - 5. Matjesfontein Valley
  - 6. Ou Werf Valley
    - a. Geology
    - b. Morphology
    - c. Geology – Overview
    - d. Geology – Calcrete
    - e. Geology – Fossils
    - f. Geology – Stone heaps
    - g. Hydrology
    - h. Archaeology – Ou Werf
  - 7. Hooie Krans Valley
  - 8. Patryze Valley
  
- L. SALT AND POTBERG RIVERS
  - 1. Geography
  - 2. Geology and tectonics
  - 3. Morphology
    - a. Salt River
    - b. Potberg River
      - 1. Upper Potbreg River Valley
  - 4. Hydrology
  
- M. SALT RIVER GORGE
  - 1. Overview
  - 2. Roads and causeways
  - 3. Geology
  - 4. Morphology
    - a. Overview
    - b. Cliffs
    - c. Valleys
      - 1. Koleskloof
      - 2. Windhoek Valley
    - d. Ravines
    - e. Pinnacles
    - f. The Island
  - 5. Tectonics
  - 6. Hydrology
    - a. Salt River Marsh
    - b. Fountains
  - 7. Archaeology
  
- N. DE HOOP VLEI GORGE
  - 1. Overview
  - 2. Morphology
  - 3. Bathymetry

4. Die Mond
  5. Geology
  6. Evidence of tectonics
  7. Karst landforms
    - a. Overview
    - b. Guano Cave
  8. Hydrology
    - a. Overview
    - b. Course and outlet – 19<sup>th</sup> Century
    - c. Water levels - 1900 to 1960
      1. Flash flood of 1957
    - d. Water levels - 1960 to 2020
      1. Floods of 2007 and 2014
    - e. Water levels after 2020
      1. Flash flood of May 2021
      2. Water levels 2021-2022
    - f. Fountains
    - g. Disappearing vlei
  9. Archaeology
    - a. Dams and canals
    - b. Ruins
    - c. Roads, dykes and stone-walls
  10. Fauna and flora
- O. EAST HARD DUNES
1. Geography
  2. Morphology
  3. Geology
  4. Caves and overhangs
  5. Pinnacles
    - a. Karst pinnacles
    - b. Non-karst pinnacles - Type A
- P. EAST VALLEYS
1. Red sand valleys
  2. Vleis
  3. Non-karst pinnacles - Type B
- Q. POTBERG MOUNTAINS AREA
1. Overview
  2. Geology
    - a. TMG rocks
    - b. Gravel terraces
    - c. Pans
  3. Morphology
    - a. Buffelsfontein Valley
    - b. Other features
  4. Archaeology
    - a. Salt mines
    - b. Fish traps – see Chapter U
- R. INFANTA AND BREEDE
1. Infanta Area
    - a. Geography and morphology
    - b. Geology and tectonics
  2. Shore geology
    - a. Overview
    - b. St Sebastian Nature Reserve Shore – Morphology and geology

- c. St Sebastian Point - Morphology and geology
- d. Infanta Village Shore - Geology
- e. Kabeljoubank to Kontiki Shore - Geology
3. Breede River Estuary
  - a. Overview
  - b. Hydrology and bathymetry
  - c. Breede River Mouth – Flow features
  - d. Breede River Mouth - Geology
  - e. Breede River offshore canyons

## S. SHALE HILLS

1. Overview
2. Geology
  - a. Overview
  - b. Bokkeveld Group
    1. Overview
    2. Shale and sandstone formations
    3. Western sandstone lenses
    4. Eastern sandstone lenses
    5. Bokkeveld Group - Bredasdorp Group contact
    6. Rounded pebbles near Bokkeveld – Bredasdorp contact
  - c. Quartz outcrops
    1. Quartz veins
    2. Hilltops and hillslopes
    3. Fault zone
  - d. Grahamstown Formation
    1. Hilltop silcretes spatial distribution (See Chapter D)
    2. Ferricretes spatial distribution (See Chapter D)
    3. Sonderkoskop - silcretes and ferricretes
    4. Rooikop – silicification, ferrugination and mineralisation
  - e. Clay
3. Morphology
  - a. African Erosion Surfaces
  - b. Post African Surfaces erosion
  - c. Drainage patterns
4. Tectonics
  - a. Overview
  - b. Compression
  - c. Faults
5. Mines
  - a. Sonderkoskop
  - b. Grootkop and Hill 288
  - c. Hill 254
  - d. Verfheuwel
  - e. Witdam-Muurkraal
6. Archaeology
  - a. Possible Stone-Age workshops SW of Swellendam
  - b. Outside the Study Area: Stone Age workshop near Gourikwa

## T. COASTAL DUNES

1. Overview
  - a. Dune formation and dune types
  - b. Dunes of the Study Area
2. Dune sedimentary processes
  - a. Shifting dunes
  - b. Stabilised dunes
  - c. Calcrete-capped dunes
  - d. Calcified dunes ('Hard Dunes')

3. Dune stabilisation and conservation
4. Struis Bay to Struis Point Dune Strip
5. Waenhuiskrans Nature Reserve Dunes
6. OTR Dune Strip
7. De Hoop Nature Reserve Dune Field

## U. SHORES

1. Overview – Geography and geology
2. Shores of the Study Area
3. Rocky shores
4. Sandy shores
5. Pebbly shores
6. Agulhas to Struis Bay Shores
7. Struis Bay Shore
8. Heunings River Estuary
9. Arniston Shores
  - a. Geology – Overview
  - b. Morphology - Overview
    1. South Shore
    2. Struis Point
    3. East Shore
    4. North Shore
  - c. Geomorphological features
    1. Notches and caves
    2. Abrasion tables
    3. Dissolution features
    4. Karst pipes
    5. Karst pinnacles
    6. Beach cusps
    7. 'Washbasins'
  - d. Archaeology - Shell middens – Struis Point
9. Overberg Test Range (OTR) Shores
  - a. Emersonklip to Martha Point
  - b. Martha Point to Die Mond
10. De Hoop Nature Reserve Shores
  - a. Introduction
  - b. Klipkoppie to Koppie Alleen – Morphology and geology
    1. Koppie Alleen – Morphology and geology
  - c. Koppie Alleen to Wyoming
  - d. Wyoming and Vaalkrans
  - e. Lekkerwater to Hamerkop
    1. Lekkerwater – Morphology and geology
    2. Hamerkop – Morphology and geology
  - f. Hamerkop to Noetsie
    1. Rooikrans and Stilgat
    2. Noetsie
      - a. Morphology and geology
      - b. Archaeology (Klipdrift Complex)
  - g. Witwatermond to Stilbaai Point
    1. Bloukrans to Mosselbank
    2. Uiterspunt
    3. Cape Infanta
11. St Sebastain Nature Reserve Shores (Infanta & Breede River Mouth Shores – see Chapter R)
12. Archaeology
  - a. Fish traps
    1. Overview
    2. Suiderstrand
    3. Rasperpunt



4. Cape Agulhas
  5. Struis Bay
  6. Struis Point
  7. Arniston
  8. Ryspunt
  9. Skipskop
  10. Breede River
- b. Stone Age shelters – See above Notes.

#### V. OFFSHORE

1. Geology
2. Bathymetry
3. Sea-level changes
4. Currents
  1. Agulhas current
  2. Rip currents
5. Archaeology - Shipwrecks

#### W. DISCUSSIONS

Geology maps discrepancies  
Enon Formation  
Bredasdorp Group Formations

- a. De Hoop Vlei
- b. Wankoe
- c. Klein Brak
- d. Waenhuiskrans
- e. Strandveld

More formations in the Bredasdorp Group?  
Quaternary sediments  
Hard Dune morphology  
West Valleys  
Ou Werf Valley fossils  
Kars River Gorge  
Salt River Gorge  
De Hoop Vlei Gorge  
De Hoop Vlei hydrology  
Drainage of De Hoop Vlei  
Palaeo Agulhas Plain  
De Hoop Nature Reserve  
Shore geology  
Karst landforms  
Dry valleys and red sand valleys  
Erosional African Surfaces  
Morpho-tectonic lineaments  
Offshore river channels

#### X. APPENDICES – FAUNA and FLORA

- a. By the author
  1. Salt River Marsh vegetation
  2. Tree - rock associations
  3. Ancient milkwood trees
  4. Bushfires
    - a. West of De Hoop Vlei
    - b. East of De Hoop Vlei
- b. By others
  1. Ramsar Convention (archival)
  2. De Hoop Nature Reserve (a) (archival)
  3. De Hoop Nature Reserve (b) (archival)
  4. Fynbos habitat of De Hoop Vlei (archival)
  5. Limestone fynbos (archival)

6. Renosterveld vegetation a. Introduction
7. De Hoop bats (archival)
8. Cape Horseshoe Bat (archival)
9. Potberg vultures (archival, a)
10. Potberg vultures (archival, b)

#### Y. APPENDICES – OTHER SUBJECTS

- a. By the author
  1. Salt River Marsh - Floods and droughts
  2. Skipskop fishing community
- b. By others
  1. De Hoop Vlei – Floods and droughts
  2. The People of De Hoop Nature Reserve
  3. Catastrophic earthquakes 70,000 years ago

#### Z. BIBLIOGRAPHY (partial lists)

1. Geography
2. Morphology
3. Geology
4. Hydrology
5. Archaeology
6. Fauna and flora

#### Z. FEATURES IN PICTURES

- a. Capes and headlands
- b. Sores and dunes
- c. Rock formations
  1. Sandstones
  2. Shales
  3. Veins
- d. Other formations
- e. 1. Sand
- f. 2. Clay
- g. 3. Gravel terraces
- h. Aeolianites
- i. Karst landforms
- j. Dissolution features
- k. Duricrusts
  1. Calcrete
  2. Silcrete
  3. Ferricrete
- l. Erosion
- m. Tectonics
  1. Folding
  2. Faulting
- n. Rivers and gorges
- o. Lakes
- p. Archaeology
  1. Stone Age
  2. Post-colonial