Archaeological Impact Assessment

Proposed subdivision and development of Portion 12 of Paapekuil Fontein 281, Cape Agulhas, Overberg, Western Cape Province

prepared for

GM Jeffery Trust
C/o Mr. Doug Jeffery
P.O. Box 44, Klapmuts, 7625, tel 021 8755272, doug@dougjeff.co.za

by

Centre for Heritage and Archaeological Resource Management cc

Peter Nilssen, CHARM, PO Box 176, Great Brak River, 6525
044 620 4936 | 0827835896 | peter@carm.co.za

Company No. CK 2006\133900\23
VAT No. 4240230989

14 December 2009

Executive Summary

On 13 and 14 November 2009, an Archaeological Impact Assessment (AIA) was conducted for the above-named subdivision and development. Most of the study area was accessible on foot though in certain areas, vegetation cover significantly restricted archaeological visibility. In such areas, the investigation focused on exposed sandy and calcrete surfaces.

The bulk of the study area is undisturbed by recent human activities except for an existing house at the SE extent of the study area, and an informal, single vehicle track running parallel with the coastline between the beach and a calcrete ridge. Dune mole rat activity occurs in the aeolian sands atop the calcrete ridge, but is particularly concentrated and extensive in the sands between the beach and the ledge of the calcrete ridge. Consequently, mole activity has irreparably damaged the context and scientific value of archaeological materials in large areas of the property.

Apart from a brief mention and presentation of images, issues regarding the existing house are dealt with by Mr. Nicolas Baumann.

Like found during earlier archaeological work in the surrounding environment, the study area is archaeologically sensitive. Just over 200 archaeological occurrences were mapped during this study. Where archaeological materials were consistent in make-up and continuous; only areas of higher or lower density were mapped, and in some cases, waypoints were fixed to indicate spatial extents of occurrences. Of the mapped occurrences, 11 are considered significant and should not be impacted directly by the proposed development.

Given the archaeological sensitivity of the study area, recommendations are made for mitigation measures to be implemented prior to and during construction as well as the operational phase. See full details in section 4.

Recommendations include, that;

- *The proposed development should not be moved inland from the calcrete ridge since archaeological materials of significance occur in this area and their context – and scientific value – is less compromised by burrowing activity than the area from the inland slope of the calcrete ridge to its ledge in the SW. Because areas on either sides of the development site are likely more sensitive, they are not considered more suitable sites for development.*
- *The placement of certain footprints and/or Portions should be reconsidered with respect to archaeological materials to avoid or minimize negative impact. See section 4.*
- *Associated with the potential relocation of certain footprints and/or Portions, the access road will require realignment in places. In other places the existing alignment of the road will directly impact archaeological materials and should be realigned accordingly.*
- *The current position of water tanks impacts directly on a substantial and significant shell midden atop a dune at the NW end of the proposed*

development. An on-site archaeologist should supervise and guide the placement and installation of the water tanks.

- *To prevent erosion and damage to archaeological materials, pedestrian access to the beach should be via narrow board walks across the calcrete ridge. In one area, between the calcrete ridge and the beach, the foot path should be aligned so as to avoid higher density shell midden materials.*
- *The more significant archaeological sites and occurrences situated in the sands on the calcrete ridge should be conserved and protected in perpetuity. Suggestions as to how this may be achieved are given below.*
- *Vegetation clearing and earthmoving activities should be monitored by - or under the supervision of - a professional archaeologist. Archaeological monitoring will ensure that negative impact on subterranean archaeological and palaeontological materials is avoided or minimized.*

Note that;

- *If archaeological materials are exposed during vegetation clearing and/or earth moving activities, then they must be dealt with in accordance with the National Heritage Resources Act (No. 25 of 1999) and at the expense of the developer. In the event of exposing human remains during construction, the matter will fall into the domain of Heritage Western Cape (Mr. Nick Wiltshire) or the South African Heritage Resources Agency (Ms Mary Leslie) and will require a professional archaeologist to undertake mitigation if needed.*

Table of Contents

1. Introduction

1.1 Background

Heritage Western Cape (HWC) did not accept an earlier AIA conducted in connection with the proposed subdivision and development of Portion 12 of Paapekuil Fontein 281, Agulhas, Cape Agulhas, Overberg, Western Cape Province (Figures 1 & 2; Kaplan 2009). As a result, and on behalf of the GM Jeffery Trust, Mr Doug Jeffery appointed CHARM to conduct a new AIA of the affected property as required by HWC (HWC unique RoD ID: 594 and unique Case ID: 554). The HWC Notice of Intent to Develop (NID) form will be completed by Mr Nicolas Baumann.

The study focused on the affected portion of the above-named property and not its entirety, but did include an area inland of the proposed locality for development as well as stretches to the NW and SE of it. The purpose of the latter was to investigate possible alternatives for placing the proposed development.

The layout plan for the development is shown in Figure 2. The proposed subdivision and development includes:

- Subdivision and rezoning as detailed in Figure 2
- Registration of Servitude Roads as detailed in Figure 2
- 5 new houses – footprint of 250m^2 - to be built on subdivided portions of 1200m^2 each
- An access and linking road consisting of an informal (unpaved) single vehicle track
- Installation of water and septic tanks and associated piping
- Potential installation of piping from existing borehole
- Pedestrian boardwalks from houses to beach

Potentially, the above activities will have a permanent negative impact on heritage related resources. Further details and specifications concerning the proposed development can be obtained from Mr Doug Jeffery.

1.2. Purpose and Scope of the Study

Objectives of the Archaeological Impact Assessment are:

- To assess the study area for traces of archaeological and heritage related resources;
- To identify options for archaeological mitigation in order to minimize potential negative impacts; and
- To make recommendations for archaeological mitigation where necessary.

Terms of Reference (ToR):
a) Locate boundaries and extent of the study area.
b) Conduct a foot survey of the study area to identify and record archaeological and heritage related resources.
c) Assess the impact of the proposed development on above-named resources.
d) Recommend mitigation measures where necessary.
e) Prepare and submit a report to the client that meets standards required by Heritage Western Cape (HWC) in terms of the National Heritage Resources Act, No. 25 of 1999.

Additional requirements and recommendations set out in HWC Rod of 1 September 2009 (HWC unique RoD ID: 594 and unique Case ID: 554); recommendations made by HWC based on a site visit by Nicholas Wiltshire and Belinda Mutti; and further points made as a

result of discussions between HWC, Mr Doug Jeffery and Mr Jonathan Kaplan – these include:
f) The AIA must indicate the extent of areas where no visible artefacts or marine shell occur. These areas to be mapped via EDM and revised development options around heritage resources must be presented.
g) AIA to include information about the 'Lord's House'.
h) Propose a practical strategy to preserve heritage resources not directly impacted by the proposed development.
i) Present alternatives should a development impact heritage resources (Section 38 (3) (f) of the NHRA).
j) Identify all heritage resources that would be affected by the proposed development.
k) Assess the potential for moving the development a few hundred meters inland to avoid the most sensitive stretch of archaeological sites.
l) Assess coastline NW and SE of proposed development site which may be less sensitive archaeologically.

1.3 Study Area

The study area is situated on Portion 12 of Paapekuil Fontein 281, approximately 7km WNW of the coastal town of Cape Agulhas on the Cape South coast (Figure 1). The study area was accessed by vehicle – escorted by Mr Doug Jeffery - on a gravel road starting adjacent to the Cape Agulhas light house. After travelling WNW to Suiderstrand, a few turns on private, single track vehicle roads lead to the study area. Paapekuil Fontein 281 borders on the Atlantic Ocean to the SW and the Agulhas National Park to the North.

Approximately 100m x 850m (8.5ha) in extent, the study area is centered on S34.78947 E19.91271 (WGS84). Coordinate data for boundary points were not available at the time of compiling this report. The topography, natural sediments and vegetation of the study area include (see Figures 2 & 3 and Plates 1 through 6):

- A rocky shoreline (intertidal) with sandy and high energy coble and pebble beaches is the SW boundary of the study area. Indigenous (coastal Fynbos), pioneering succulents, grasses and shrubs occur on the upper reaches of the beach.
- A mini coastal plain/platform (MCP) averaging about 40m in width that consists of gently undulating aeolian dune sands though pebbles and cobbles are present where high energy beaches occur. The MCP is oriented parallel with the shoreline and sandwiched between the beach and a dune-capped calcrete ridge. Dune sands slope up toward the edge of a calcrete ridge to the NE. The middle and seaward side of this area is variably vegetated by coastal Fynbos grasses, succulents and shrubs while the upper slopes toward the calcrete ledge include low bushes and scrubs.
- A calcrete ridge (aeolianite or fossil dune) – running parallel to the shoreline and averaging some 50m in width - is capped by undulating aeolian dune sands varying in thickness up to around 3m. A larger dune – the proposed site for water tanks – at the NW extent of the study area rises to about 20m above mean sea level. The SE edge of the ridge consists of a variably exposed calcrete ledge that is collapsed in places and that abuts the dunes sands rising up from the MCP. The calcrete ledge and collapsed portions of it were created by former high sea level sands, in all likelihood that of the mid Holocene. Vegetation in this area consists of a variety of coastal Fynbos plants, dominated by bush and scrub. No trees or thickets were seen.
- Dune sands capping the calcrete ridge slope down toward the NE into a roughly linear depression (called the trough) where - for the most part – the underlying

calcrete is covered by thin sand bodies, particularly in the NW part of the study area, while variably aligned dunes containing thicker sand bodies are more common in the SW. It appears that the underlying and patchily exposed calcrete is at the same elevation as that of the calcrete ridge and that the trough was formed as a result of dune formation, movement and depletion. The trough slopes up gently to the NNE. Here the vegetation is like that on the calcrete ridge though lower growing species are more common in areas where the sand body covering the calcrete is thinner. No trees or thickets were noted.

An old house (in excess of 60 years), which has undergone substantial alteration, is situated at the SE extent of the study area (Figures 2 & 8, Pate 3 and Table 1; waypoint 140). The house and heritage issues relating to it are dealt with in detail by Mr. Nicolas Baumann (see Section 1.2 g above).

A single vehicle track leads to the existing house and runs to the NW on the seaward edge of the MCP. This track's NW end is at about midway of the study area (Figures 2, 7 & 8). A few pedestrian tracks run along and across the calcrete ridge and into the trough in the NE of the study area. The MCP is intensely and extensively disturbed by dune mole rat activity and archaeological visibility is restricted to mole heaps, pedestrian and vehicle tracks. Dune mole rat activity is notably less on the calcrete ridge and decreases as one walks inland. Archaeological visibility is good on the calcrete ridge with the bulk of material brought to the surface via burrowing activity. Wind and water erosion has exposed extensive portions of the calcrete ledge as well as archaeological materials once buried in sands capping the calcrete surface. In the near absence of burrowing activity and as a result of dense vegetation cover, archaeological visibility is very poor in the trough NNE of the calcrete ridge where the only opportunity for archaeological inspection is on exposed calcrete surfaces.

1.4 Approach to the Study

The Cape Agulhas area has received considerable archaeological attention including the identification and recording of numerous sites, mostly of Later Stone Age (LSA) origin, along the coastline and its immediate surroundings (Hall 1984, Hart 2004, Hine 2008, Kaplan 1997, 1999, 2003 & 2009, Nilssen 2004, see additional references in Hine 2008).

Numerous tidal fish traps occur in the intertidal zone along the coast (Avery 1974, Goodwin 1946 and Hine 2008 and references therein). Apparently, a tidal fish trap is situated in the intertidal zone at the SE extent of the study area, but this feature was not observed as the study coincided with neap tides. In his Masters dissertation, Hine writes; "The results of the archaeological investigation indicated no association between the LSA middens and fish traps and none of the archaeological sites in the literature suggest fishing on the scale normally associated with fish trapping. In contrast, there was a strong link between the building and use of fish traps amongst historic communities along the south coast. Based on the current evidence a pre-colonial age for the practice of fishing with stonewalled tidal fish traps can no longer be entertained" (Hine 2008 pg i and see references therein). Overall, the study area is situated in an archaeologically sensitive environment dominated by shell midden deposits originating in the LSA (post mid Holocene high sea stand - <5000 BP) and pottery period (up to around 1400 BP – Hine 2008). Several buildings of the Colonial period occur on farms in the surrounding area (Hine 2008, Kaplan 2009).

On behalf of the GM Jeffery Trust, Mr Doug Jeffery provided background information and documents as well as layout plans for the proposed development (Figure 2). The author

accessed and located the study area with Mr Jeffery's assistance, after which the study was conducted independently.

Due to relatively open and low vegetation, the bulk of the study area was accessible on foot and ground surfaces were variably exposed for archaeological inspection (see section 1.3 above). The entire survey was conducted on foot.

Though survey via EDM was not conducted, the extents of sites were mapped via GPS where possible (also see Table 1). Apart from the MCP, all archaeological occurrences are described and illustrated, thus indicating areas where materials are not visible (see point f in section 1.2 above).

To accommodate points k and l in section 1.2 above, the study area was extended about 200m inland from the SW boundary of the proposed development, 120m NW of the NW boundary and 500m SE of the SE boundary (Figures 3 & 6 through 8). The rationale for this was to assess the immediate surroundings for areas of less archaeological sensitivity, which may provide alternatives for placing the proposed development.

Survey tracks were fixed with a hand held Garmin Camo GPS – using map datum WGS84 - to record the searched area (Figures 3 & 4, gpx tracking file submitted to HWC and is available from author). Observations and photo localities were also fixed by GPS (Figures 3 & 5 through 8 and Table 1). Digital audio notes and a high quality, comprehensive digital photographic record were also made (full data set available from author).

Only archaeological occurrences considered significant and/or discussed individually in the text are labeled in illustrations where the development layout is overlaid on an aireal photograph. This decision was made as including all waypoint names in the graphics makes many illegible and results in clutter. All labeled waypoints are shown in Figures 7, 9, 11 and 12. See Table 1 for additional details of individual sites not described individually. Final editing of the placement and proposed placement of houses and/or portions are presented in Figures 7, 9 and 11 and their illustration in other figures should be ignored. Due to its size, Table 1 is presented at the end of the document as Appendix A.

2. Results

In 1.5 days of survey a distance of 19.3km was walked, covering an area of about 12ha, of which an average of around 40% provided good archaeological visibility.

Unless stated otherwise, all sites are of LSA origin. While many more were identified, 209 archaeological occurrences were logged and mapped. Where archaeological occurrences were continuous and similar in content, every occurrence was noted but not photographed or mapped. Rather, areas of lower and higher density were mapped, photographed and recorded. Occurrences of notably higher densities and/or displaying different cultural or shell species content were treated as individual sites and recorded accordingly. Sites considered of local and/or regional significance are described and discussed individually.

The three areas – aside the beach – described in section 1.3 above are treated individually for ease of description and since each contains similar - and often related - archaeological occurrences.

2.1 The MCP

The entire length of this area contains a continuous, interconnected scatter of shell midden materials and includes **waypoints 11 - 20, 83, 99 and 102 - 115** (Figures 3, 5 through 12, Plates 2, 4, 6 & 11 and Table 1). See Table 1 for site-specific details. All archaeological materials are exposed in mole heaps and densities of shell scatters rise and fall between very low and medium. Shellfish remains include haliotis, turbo, limpet species, barnacle, chiton, and adiagnostic fragments. Stone occurs in some scatters, but in low numbers and is overwhelmingly dominated by quartzite with only a few pieces of quartz observed along the length of the MCP. Observed stone artefacts consist of flaked cobbles, flakes and chunks. No formal tools were seen. A single fragment of ostrich egg shell was seen at waypoint 105 (Plate 11). No bone of archaeological origin was noted.

Significance & Recommendation: These occurrences are irreparably damaged by mole rat activity and as a result retain no scientific value. Because these occurrences were recorded during this study, it is recommended that no further mitigation is required.

Waypoints 100 - 101 represent an area on the MCP where densities range from low-medium to medium-high. Archaeological materials exposed through mole activity suggest that this occurrence, centered on a flat-topped dune, represents a midden rather than a scatter of shell and stone (Plate 2). It is likely that a substantial sub-surface midden deposit occurs, but is compromised by intense burrowing activity. Densities of material drop dramatically as one walks away from the small dune. The extent of the site was recorded by fixing a GPS track while walking on the periphery of the denser scatter on and around the small dune (Figures 5, 10 & 11 and Table 1). The shellfish composition and stone artefacts are like those described above for other occurrences along the MCP. No other cultural material or bone was seen.

Significance & Recommendation: This site is considered of local significance and should be avoided by the foot path crossing the MCP from the calcrete ridge to the beach. The foot path should be aligned to by-pass the site (see thin red line in Figure 8).

Waypoints 116 - 117 are situated at the junction between the MCP and the calcrete ridge at the NW extent of the study area and NW of the proposed development (Figures 3, 6 & 7 and Plates 4 & 11). The material spilling over the calcrete ledge and into the sands of the MCP originates in the sands overlying the calcrete ridge. It is clear that materials are eroding from this sand body. The calcrete ledge is seldom exposed in this part of the study area, and the depositional environment here hints at the depositional history of archaeological occurrences recorded on the exposed calcrete ledge to the SE. Shell midden materials occur at medium to high densities and extend for at least 35m along the calcrete and MCP junction. Shellfish specimens include haliotis, limpet species, turbo, chiton, periwinkle and whelk. Stone artefacts in quartzite consist of a hammer stone, flaked cobble, flakes and chunks. Quartz occurs in lower numbers and artefacts include cores, flakes and chunks. No formal stone tools were recorded. No other cultural material was seen though ostrich egg shell was recorded at a nearby occurrence. No bone of archaeological origin was seen.

Significance & Recommendation: Because of its size, content and integrity, this site is considered of high local and low regional significance. Because burrowing activity is less severe in this area, particularly in the sand body on the calcrete ridge that houses *in situ* material, this site is likely a good representative example of other, more disturbed or eroded sites recorded along the calcrete ridge to the SE. It is very likely that similar sites occur further NW of the proposed development site. Consequently, it is recommended that the development is not moved to the NW of its current location as this alternative is likely to impact on significant archaeological materials that are in good depositional context.

2.2 The Calcrete Ridge

While archaeological occurrences along the SW ledge of the calcrete ridge are more or less continuous in the SE sector, this is not the case in the NW half of the study area. This observation is partly a function of the ledge being more and less exposed in the SE and NW halves of the study area respectively. In the SE half, where archaeological occurrences were continuous and similar in content, every occurrence was noted but not photographed or mapped. Rather, areas of lower and higher density were mapped, photographed and recorded. Occurrences of notably higher densities and/or displaying different cultural or shell species content were treated as individual sites. In the NW half, however, every occurrence was mapped as the number of occurrences was not so high and because occurrences were commonly isolated. Due to the high number and similarity in occurrences, not every occurrence in this area was photographed.

Archaeological occurrences on the calcrete ridge occur in two related depositional contexts. These are the exposed calcrete ledge where materials have been eroded and/or deflated from the dune sands atop the calcrete ridge; and mole heaps and/or eroded areas on exposed surfaces of undulating dune sands. At numerous occurrences the relationship between materials on the calcrete ledge and those in the dune sands is visibly evident from archaeological materials eroding out of the sands and onto the calcrete ledge. It follows that occurrences on exposed calcrete are in secondary context while those in the dune sands are in or close to primary context.

Waypoints 26 – 38, 41 – 52, 54 – 56, 58, 59, 61 – 67, 69 – 72, 74 – 82, 84, 92, 96 – 98, 133 - 139, 141, 143 – 166, 168 – 176 and 229 - 231 are lumped for descriptive purposes as they are continuous and/or similar in content (Figures 3 & 5 through 12, Plates 5, 7, 8 & 12 and Table 1). Further details for individual sites are given in Table 1. The bulk of these occurrences comprise scatters of shellfish in very low to low densities. Very few scatters are of medium density and only one was regarded as medium to high density (waypoint 58). Shellfish frequencies are proportional to the densities of occurrences. No marked variation in shellfish species composition was evident between these sites. Commonly identified species include turbo, periwinkle, various limpet species, haliotis, chiton and whelk.

Most occurrences contain no cultural remains and where stone artefacts were observed, they were overwhelmingly in quartzite with notably lower numbers in quartz. Frequencies of stone artefacts – low overall - varied moderately between occurrences and only one site contained markedly higher numbers (waypoint 58). Stone artefacts include flaked cobbles, flakes, chunks, cores and a quartzite hammer stone. A few ostrich egg shell fragments were recorded at two occurrences (waypoints 61 & 81). No bone or other cultural remains were identified.

Significance & Recommendations: Waypoint 82 is a medium density scatter of shell midden material as described above and though not visibly connected with JT3 is reminiscent of it and may be an extension of it. Like JT3, the occurrence at waypoint 82 is considered of low significance. The house on portion 1 is currently sited some 6m from the calcrete ledge and 14m NW of waypoint 82. To avoid the latter occurrence, it is recommended that the front of the proposed house at portion 1 be placed in a direct NW line from its current location to no less than 15m from the edge of the calcrete ledge.

Waypoints 69 – 71 are low-medium to low density scatters of shell midden material as described above and are considered of low significance. While the current position of the proposed house on portion 3 is 40m from the core and 20m from the edge of site **JT2**, it lies only 7m from waypoint 70. If the development is approved, and because the subsurface

nature and integrity of these occurrences are not known, it is recommended that test excavations be conducted prior to the construction phase of the development for final placement of the house on portion 3.

The current position of the proposed house on portion 4 will directly impact on **waypoint 64**, a medium density scatter of shell midden material (Table 1). Several more occurrences occur in close proximity and since the sub-surface nature of the archaeological material is not known, it is recommended that – from the perspective of archaeological sensitivity - waypoint s066 is a more suitable position for the house and that portion 4 be relocated accordingly (Table 1 and Figure 7).

Waypoints 118 – 131 represent archaeological occurrences situated at and beyond the NW extent of the study area (Figures 3 & 5 through 7, Plates, 1, 2 & 10 and Table 1). Here the calcrete ridge is capped by a notably higher dune than elsewhere in the study area. The occurrences are continuous scatters of shell midden material, visible on the surface in medium to low densities and are extensions of the shell midden recorded at waypoints 85 – 91. The shellfish component includes haliotis, limpet species, turbo, chiton, periwinkle and whelk, but relative species composition cannot be determined at this time. Stone artefacts are in quartzite and include flaked cobbles, flakes, cores and chunks. No other cultural material or bone was observed.

Significance & Recommendations: Waypoints 118 - 131 are part of the large shell midden recorded at waypoints 85 – 91. Due to its size, contents and notably less burrowing activity in this area, the site is considered of high local and medium regional significance. Since this part of the midden – besides occurrences at waypoints 130 and 131 - falls outside the proposed development, it will not be impacted, but it is recommended that the development is not moved further to the NW. Waypoints 130 and 131 should be lumped with waypoints 85 – 91 regarding recommendations for mitigation measures.

Waypoints 85 – 91 are a series of occurrences that represent a large shell midden sited in and near the top of a large dune at the NW extent of the study area (Figures 3 & 5 through 7, Plates 1, 2 & 10 and Table 1). Materials occur in medium to high densities, are eroding out on the sides of the dune and exposed through burrowing activity on top of it. Waypoints 118 – 131 are an extension of this site. Marine shellfish remains include haliotis, limpet species, turbo, chiton, periwinkle and whelk, but the relative species frequencies cannot be determined at this time. Stone artefacts are exclusively in quartzite. Artefacts include flaked quartzite cobbles, cores, flakes, chunks and hammer stones, including a small quartzite hammer stone. No formal tools, bone or other cultural remains were identified.

Significance & Recommendations: Waypoints 85 – 91 represent a large shell midden considered of high local and medium regional significance because of its size, content and relatively undisturbed context. The current position of water tanks for the development is on top of the dune that contains this midden. Though the midden is buried in the dune, it is recommended that the dune top is capped by sand before placing the water tanks. The placement and installation of the water tanks should be supervised and guided by a professional on-site archaeologist. After installation, disturbed sands around the water tanks should be stabilized and re-vegetated. Balustrades around this midden, including waypoints 130 and 131, should be erected for its protection.

Waypoint 73 was previously recorded as **JT1** (see Kaplan 2009 and descriptions therein; Figures 5 through 7, Plate 9 and Table 1). The perimeter of the shell midden was walked with a GPS to record its extent (Figure 6). In addition to midden contents described by Kaplan, an unfinished ostrich egg shell bead was recorded (Plate 9). The proposed site for the house on portion 3 (waypoint 4) is more than 40m from the perimeter of JT1 and will

therefore have no impact on the site. The access or linking road runs between 25 and 30m to the NW of JT1.

Significance & Recommendations: Waypoints 73 (JT1) is considered of high local and low to medium regional significance. The site will not be impacted by the proposed development during the construction phase, but parts of it will be exposed and vulnerable during the operational phase. Suitable balustrades should be installed, enclosing or partly enclosing the site to protect it from pedestrian traffic and other recreational activities. Home owners must be informed of the value and legal protection of the site and details for its conservation and management should be included in the ACMP.

Waypoints 3, 94, 95 and 167 are situated in close proximity to **JT7**, previously identified, recorded and described by Wiltshire & Mutti (2009; Figures 5, 8 & 9, Plate 10 and Table 1). These occurrences are medium density scatters of shell midden materials comprised of limpet species, turbo, chiton, periwinkle, whelk and haliotis. Stone artefacts are mostly in quartzite and include flakes, flaked cobbles; a hammer stone - and the few pieces of quartz included flaked pieces, a flake and chunks. Two pieces of undecorated, quartz tempered pottery were identified – like those at JT2 and JT3 (Kaplan 2009), but no bone or other cultural remains were seen. It is likely that these occurrences form part of the same site and that sub-surface deposits are in reasonable context.

Significance & Recommendations: These occurrences are considered of local importance and several additional occurrences were recorded to the SE. The proposed location of the house on portion 4 is surrounded by archaeological occurrences and it is recommended, therefore, that a more suitable location for this house is at waypoint s066 and that portion 4 is relocated accordingly (Figure 8 and Table 1). Suitable balustrades should be installed, enclosing or partly enclosing the site to protect it from pedestrian traffic and other recreational activities. Home owners must be informed of the value and legal protection of the site and details for its conservation and management should be included in the ACMP.

Waypoint 68 was previously recorded and described as **JT2** (Kaplan 2009). The site consists of medium to high density scatters of shell midden materials, the contents of which are as described by Kaplan (2009). The extent of the site was recorded by laying a GPS walk track along the periphery as observed by the presence of materials exposed in mole heaps and on eroded surfaces (Figures 5, 8 & 9, Plate 8 and Table 1). Sub-surface archaeological deposits are likely dense and in good context.

Significance & Recommendations: JT2 is considered significant and should be protected and conserved in perpetuity. The current position of the proposed house on portion 3 is 40m from the core and 20m from the edge of the site and will not directly impact on it. See discussion on waypoints 69 – 71 above. As described above for JT1, and prior to the construction phase, suitable balustrades should be installed to enclose or partly enclose the site to protect it from pedestrian traffic and other recreational activities. Home owners must be informed of the value and legal protection of the site and details for its conservation and management should be included in the ACMP.

Waypoint 57 (and 178) is located on the NE edge of the calcrete ridge and in the dune sands capping the ridge (Figures 5, 8 & 9, Plate 8 and Table 1). To the NE, the dunes slope down into the trough. The occurrence of medium to low density shell midden material is exposed on the NE slope and base of a low dune. Materials are exposed in a few mole heaps, are eroding from the dune, and settling at the base of it in a deflated context. *In situ* material is expected to occur in the dune sands. While of medium to low density, the contents of this site is notably different from those recorded elsewhere on the calcrete ridge. Shellfish remains are dominated by limpet species and the only other species identified are

periwinkle and turbo. Unlike turbo seen at other occurrences on the ridge, here the specimens are markedly smaller. No other species were identified. Quartz and quartzite stone artefacts occur in roughly the same, low numbers. Pieces include flaked cobles and chunks. Several pieces – more than seen elsewhere - of ostrich egg shell were recorded.

Significance & Recommendations: While of medium to low density, the content of this occurrence is markedly different from others recorded on the calcrete ridge. Lower densities of material often allow for greater archaeological resolution. As described above and because of lower mole rat activity in this area, materials in good context are likely to occur in the dune sands. Based on the above, this occurrence is considered of high local significance and low to medium regional significance. Deposits should be protected and conserved in perpetuity. Deposits of significance are situated immediately SW of waypoint 57 (178) and the alignment of the proposed access or linking road is immediately to the N. To ensure that the occurrence is not negatively impacted by the road, it is recommended that it be aligned hard against the development boundary. Like elsewhere, suitable balustrades should be installed, enclosing or partly enclosing the site to protect it from pedestrian traffic and other recreational activities. Home owners must be informed of the value and legal protection of the site and details for its conservation and management should be included in the ACMP. .

Waypoints 39 & 40 are occurrences of the same shell midden located on the exposed calcrete ledge and in the abutting dune sands on the SW edge of the calcrete ridge (Figures 5 & 10-12, Plate 7 & Table 1). Midden materials occur in mostly high densities for at least 25m along the calcrete ledge and an indeterminate distance into the sands overlying the calcrete. It is clear that the materials on the exposed calcrete ledge originate in the abutting and overlying dune sands. Shellfish remains include turbo, haliotis, limpet species and chiton. Stone artefacts including flaked cobbles, flakes, chunks and cores are in quartz and quartzite in roughly even numbers. A quartzite hammer stone as well as a few fragments of ostrich egg shell were recorded.

Significance & Recommendations: Due to its size, density, content and the indeterminate extent of *in situ* deposit extending into the dune sands, this site is considered of high local and medium regional significance. The proposed development will not directly impact this site as it lies outside the development boundary. It is recommended that the development not be moved to the SE from its current position.

Waypoints 22, 24 & 25 are interconnected occurrences of the same archaeological deposit (Figures 3 & 12, Plates 2 & 6 and Table 1). These occurrences are the same as that described for waypoints 39 & 40 except that densities are medium to high and the extent along the exposed calcrete ledge is at least 50m. Shellfish remains are dominated by haliotis, and stone artefacts are mostly in quartzite including flaked cobbles and a broken hammer stone. Flaked quartz pieces occur in low numbers.

Significance & Recommendations: Due to its size, density, content and the indeterminate extent of *in situ* deposit extending into the dune sands, this site is considered of high local and medium regional significance. The proposed development will not directly impact this site as it lies outside the development boundary. Similar sites are very likely to occur in the same context all along the calcrete ledge to the SE. It is recommended that the development not be moved to the SE from its current position.

2.3 The Trough

The location and nature of the trough are described in section 1.3 above. While vegetation cover is low and most of the area is accessible on foot, ground cover is thick, reducing archaeological visibility to zero in areas outside exposed calcrete surfaces.

Investigation was restricted to exposed surfaces on small and remnant dunes as well as exposed calcrete surfaces. Dune mole rat burrowing is rare in this area and does not seem to occur in the trough where sand bodies are less than a meter or so thick. Archaeological traces were rarely seen on exposed dune surfaces, but occur on nearly all exposed calcrete surfaces. Because archaeological visibility is very low, burrowing and other disturbances are rare and occurrences are notably different in content than those recorded elsewhere, this area – in general - is considered more sensitive than the MCP and the calcrete ridge. It is recommended, therefore, that this area is not suitable for development. In the general descriptions given below, occurrences are grouped by stone artefact raw material or depositional context (see Table 1 for further details on individually recorded occurrences).

Waypoints 180, 181, 183 – 190, 196 – 204, 206 – 210 and 212 - 228 represent archaeological occurrences recorded on exposed calcrete surfaces – of variable size - surrounded by densely vegetated sand bodies (Figures 3, 5 through 11, Plates 1, 5 & 12 through 14 and Table 1). An exception, waypoint 209 is a scatter of a few shells (turbo & limpet) on an exposed dune surface. In many places it is clear that recorded materials originate in the sand bodies and become exposed as a result of wind and/or water erosion. The extents of exposures, therefore, are not the extents of archaeological materials. The extent, content and nature of *in situ* or near primary context materials cannot be determined or estimated from recorded occurrences. As a result, even though densities of materials are low, this area is considered particularly sensitive.

Occurrences are best described as shell and stone or stone and shell – depending on which is present in higher numbers - scatters rather than remnants of shell midden deposits. Though shellfish species representation varies between occurrences, they include a combination of chiton, limpet species, turbo and periwinkle. Turbo is dominant at most sites, exclusive to some and haliotis was seen at only one occurrence. Stone artefacts occur in low to very low numbers – like shell – and are absent from some occurrences. Quartz is overwhelmingly dominant and quartzite is present at only a few scatters. Artefacts include flaked pieces, flakes, chunks, chips and one small quartzite hammer stone. No formal tools were recorded. No bone or other cultural remains were seen.

Significance & Recommendations: For the above reasons, the archaeological record in this area is considered sensitive. The present layout for development will not impact the archaeology in this area and it is recommended that this area is not a suitable alternative for development.

Waypoints 191 - 195 are occurrences like those described above with the exception that densities are slightly higher (low density), and stone artefacts – present in low numbers - are exclusively in quartzite. Due to the latter, these occurrences make for a good comparison with the quartz dominated assemblages. The significance and recommendations given above apply.

Waypoint 182 is a medium to high density shell and stone scatter on an exposed stretch of calcrete that is enclosed by a densely vegetated sand body (Figures 5, 8 & 9, Plate 13 and Table 1). No evidence for burrowing activity was seen. Exposed materials are eroding from the surrounding sand body, which contains *in situ* deposits. Marine shellfish remains occur in lower numbers than stone artefacts, and include turbo, chiton, limpets and haliotis. Of all recorded occurrences, the highest numbers of stone artefacts were seen here (Plate 13). There are high numbers of artefacts in quartz while quartzite is rare. Cores, a bipolar core, debitage, micro-debitage, flakes, chunks and chips were seen in quartz. Quartzite pieces include hammer stones and flaked cobbles. No bone or other cultural remains were noted.

Significance & Recommendations: Due to its unique character and the presence of *in situ* deposits, this site is considered of high local and low to medium regional significance and should not be disturbed. The present layout for development will not impact the archaeology in this area and it is recommended that this area is not a suitable alternative for development.

Waypoint 205 is located on the NE upslope of the trough where shell midden deposits are eroding from a sand body adjacent to and NE of an exposed calcrete surface (Figures 3, 6 & 7, Plates 5 & 12 and Table 1). At the point where midden deposits are eroding from the sands, the density of materials is high and an indeterminate expanse of in situ deposits extends beneath the sand surface. No evidence of animal burrowing was seen in the immediate vicinity of this site. Shellfish species include periwinkle, turbo, chiton and limpet species with turbo represented by very large specimens. Stone artefacts occur in moderate numbers in roughly equal frequencies of quartz and quartzite. These include flaked cobbles, cores, flakes, chips, chunks and hammer stones. No formal tools, bone or other cultural materials were recorded.

Significance & Recommendations: Being a large, high density and relatively undisturbed site with *in situ* material, this shell midden is considered of high local and low to medium regional significance and should not be disturbed. This site will not be impacted by the proposed development, but as described above for other archaeological occurrences in the trough, this area is not a suitable alternative location for development.

Waypoint 211 is a stone and shell scatter deflated onto an exposed calcrete surface and is sited 40m ENE of waypoint 182 (Figures 5, 8 & 9, Plate 14 and Table 1). Like most occurrences in the trough, *in situ* material is bedded in the low sand body from which it is deflated onto the calcrete surface. No evidence of mole activity was seen, indicating that buried deposits are in an undisturbed context. Shellfish densities are very low while quartz artefacts are present in high numbers. Shellfish species are overwhelmingly dominated by turbo and a few limpets were recorded, but the remainder shell consists of highly fragmented, adiagnostic pieces. Artefacts in quartz include cores, bipolar cores, flakes, chunks, chips and micro-debitage. Quartzite artefacts are few and include flaked cobbles, flakes and a small hammer stone.

Significance & Recommendations: A rare, undisturbed site with *in situ* material, this stone and shell scatter is considered of high local and low to medium regional significance and should not be disturbed. This site will not be impacted by the proposed development, but as described above for other archaeological occurrences in the trough, this area is not a suitable alternative for development.

3. Sources of Risk, Impact Identification and Assessment

Without the implementation of mitigation measures, the following activities associated with the proposed development will have a permanent, negative impact on archaeological resources. Table 2 summarizes the impact of the proposed development on archaeological resources with and without mitigation.

The planning phase includes;

- Layout and placement of activities, structures, services and installations

In the current layout for development, the placement of some activities is in conflict with archaeological occurrences that are considered significant and that should not be disturbed. Such conflicts should be resolved by revising the placement of certain activities

relative to the position of affected archaeological resources. The placement of the development as a whole will impact heritage resources and therefore, alternatives were investigated as required in Section 38 (3) (f) of the NHRA, Act 25 of 1999.

The construction phase includes;

- Construction of 5 new houses – footprint of 250m^2 - to be built on subdivided portions of 1200m^2 each
- An access and linking road consisting of an informal (unpaved) single vehicle track
- Installation of water and septic tanks and associated piping
- Potential installation of piping from existing borehole
- Pedestrian boardwalks from houses to beach

Construction and installation activities will include vegetation clearing and earthmoving activities that will – to a greater or lesser extent - directly impact identified archaeological occurrences. In some situations, such activities should be moved and in others they require relocation. Some activities will not have a negative impact on archaeological resources and their proposed placement can remain unchanged. In areas where the context and significance of materials are irreparably damaged by natural agents, development activities are of a lesser concern. It is highly likely that vegetation clearing and earthmoving activities will expose archaeological materials. Archaeological monitoring of these activities will avoid and/or minimize negative impacts.

The operational phase includes;

- Pedestrian traffic and human recreational and other activities

Because significant sites occur within the boundaries of the proposed development, it is certain that such sites will be impacted by pedestrian traffic and recreational activities. Mitigation measures can be implemented to avoid negative impacts from such activities. Additionally, the implementation of an Archaeological Conservation Management Plan designed for the development will aid in protecting and conserving archaeological resources in the long term.

Table 2. Impact on and loss of archaeological resources with and without mitigation.

	With Mitigation	Without Mitigation
Extent	Local	Local & Regional
Duration	Permanent	Permanent
Intensity	Low	High
Probability	Low	High
Significance	Low	High
Confidence	High	High

Provided that the recommended mitigation measures – if and as approved by Heritage Western Cape - are implemented, it is suggested that the proposed location for development be approved.

4. Required and Recommended Mitigation Measures

Required mitigation measures:

- In the event that vegetation clearing and earthmoving activities expose significant archaeological, paleontological or heritage related resources, such activities must stop, and Heritage Western Cape must be notified immediately.
- If significant archaeological materials are exposed through earthmoving activities, then they must be dealt with in accordance with the National Heritage Resources Act (No. 25 of 1999) and at the expense of the developer(s) and/or property owner(s).
- Unmarked human burials may occur anywhere in the landscape and are often exposed during earthmoving activities, particularly in soft sediments like those in the area proposed for development. Human remains are protected by law and, if older than 60 years, are dealt with by Heritage Western Cape (Mr. Nick Wiltshire 021 483 9685) or the State Archaeologist at the South African Heritage Resources Agency (Mrs. Mary Leslie who can be reached at 021 462 4502).

Recommended mitigation measures:

- Alternatives for site of development;

1. The MCP. According to the client, this area is not a desirable option for development. The MCP comprises highly disturbed sediments containing irreparably damaged archaeological deposits. Though there are several constraints and environmental concerns regarding this area, it is archaeologically less sensitive than other studied areas.
2. Coastline on either sides of the proposed development. While not exhaustively investigated, the areas immediately adjacent to the proposed development site are as, or more archaeologically sensitive and therefore, it is suggested that these areas are not suitable for development. Also see section 2 above.
3. The Trough. Due to the presence of several significant archaeological occurrences and the fact that this area is relatively undisturbed, it is recommended that the trough is not a suitable area for development.
4. The Calcrete Ridge. Numerous archaeological occurrences and sites were recorded here, but often in disturbed contexts. Though several measures in mitigation of archaeological resources should be implemented, this area is regarded as the best development site among the above options bar the MCP.

- Portions and Houses;

1. The house on portion 1 is currently sited some 6m from the calcrete ledge and 14m NW of waypoint 82. To avoid the latter occurrence, which may be an extension of JT3, it is recommended that the front of the house be placed in a direct NW line from its current location to no less than 15m from the edge of the calcrete ledge. See section 2.2 above.
2. While the current position of the proposed house on portion 3 is 40m from the core and 20m from the estimated edge of site JT2, it lies only 7m from waypoint 70 and in close proximity to waypoints 69 & 71. If the development is approved, and because the subsurface nature and integrity of these occurrences are not known, it is recommended that test excavations be conducted prior to the construction phase of the development for final placement of the house. See section 2.2 above.
3. The current position of the proposed house on portion 4 will directly impact on waypoint 64**.** Several more occurrences occur in close proximity and since the sub-surface nature of the archaeological material is not known, it is recommended that –

from the perspective of archaeological sensitivity - waypoint s066 is a more suitable position for this house and site for the relocation of portion 4. See section 2.2 above.

- Access and Linking Roads;

1. The main access road already runs through the SW portion of the site at waypoints 100 & 101. The road will not be altered, but will be maintained, so no further negative impact on this site is envisaged. See section 2.1 above. It is recommended that the alignment of the road not be changed in this area.
2. The alignment of access and linking roads in the area between portions 3 and 5 is in conflict with numerous archaeological occurrences including three considered to be of high local significance. It is recommended that the proposed realignment - as illustrated by thick red lines in Figure 8 - be considered so as to avoid negative impact on known archaeological occurrences. See section 2 above.

- Water Tanks;

1. The current position of water tanks for the development is on top of a dune that contains a large, significant shell midden. Though the midden is buried in the dune, it is recommended that the dune top is capped by sand before placing the water tanks. The placement and installation of the water tanks should be supervised and guided by a professional on-site archaeologist. After installation, disturbed sands around the water tanks should be stabilized and re-vegetated. See sections 1.3 and 2.2 above.

- Board walks from Houses to Beach;

1. Where boardwalks straddle parts of the calcrete ridge, they should be aligned in a SW direction from each portion to the beach. The foot path from portion 5 to the beach should run directly W from the portion to avoid the shell midden at waypoints 100 & 101 (see thin red line in Figure 8). See section 2.1.

- Archaeological Sites – JT1, JT2, JT7 & waypoints 57, 85-91 & 130-131;

1. Experience has shown that “hiding” shell middens in a controlled and managed way is an effective way to protect them from human activity. While capping shell middens with biddum, sediments and then re-vegetating the area has worked elsewhere, this measure is unlikely to work here. High winds are common in this area and any disturbance to plants and/or surface sediments poses a great threat to wind erosion that will have a negative impact on archaeological deposits as well as other aspects of the local ecosystem. It is recommended therefore, that suitable balustrades should be installed to enclose or partly enclose sites to protect them from pedestrian traffic and other recreational activities. Home owners must be informed of the significance, value and legal protection of archaeological sites and details for their conservation and management should be detailed in the ACMP.

- Because sub surface archaeological remains do occur in the area, all vegetation clearing and earthmoving activities should be monitored by - or under the supervision of - a professional archaeologist. Archaeological monitoring will ensure that negative impact on subterranean archaeological and paleontological materials is avoided or minimized.

References

Avery, G. 1974. Open station shell midden sites and associated features from the Pearly Beach area, south-western Cape. South African Archaeological Bulletin 30:103-105.

Goodwin, A.J.H. 1946. Prehistoric fishing methods in South Africa. Antiquity 20:134-141.

Hall, M. 1984. The Late Stone Age in the Cape Agulhas area: a distributional study. Part one: Final report to the Human Sciences Research Council. Spatial Archaeology Research Unit, Dept. of Archaeology, University of Cape Town.

Hart, T.J. 2004. Heritage Impact Assessment of Portion 15 of Paapkuilfontein 28, Cape Agulhas, South Africa. Archaeology Contracts Office, University of Cape Town.

Hine, P.J. 2008. Stone-walled tidal fish traps: An archaeological and archival investigation. Unpublished Masters thesis, Dept. of Archaeology, University of Cape Town.

Kaplan, J. 1997. Archaeological study, Erf 194, 195 & 196, Suiderstrand. Report prepared for Annuke de Kock Environmental Consultant. Agency for Cultural Resource Management.

Kaplan, J. 1999. Archaeological study, Erf 193, Suiderstrand. Report prepared for Cape Coastal Development (Pty) Ltd. Agency for Cultural Resource Management.

Kaplan, J. 2003. A Phase 1 Archaeological Impact Assessment of a proposed rest camp facility at Pietie se Punt Agulhas National Park. Report prepared for SRK Consulting Engineers and Scientists. Agency for Cultural Resource Management.

Kaplan, J. 2009. Archaeological Impact Assessment proposed subdivision of Portion 12 (a Portion of Portion 10) of the farm Paapekuil Fontein No. 281 Cape Agulhas. Agency for Cultural Resource Management.

Nilssen, P.J. L'Agulhas Links Golf Resort: Erven 678, 679, 680 and 1251, Agulhas, Western Cape Province. Archaeological Heritage Impact Assessment based on foot survey and shovel test excavations. Draft report prepared for Doug Jeffery Environmental Consultants. Mossel Bay Archaeology Project.

Wiltshire, N & Mutti, B. 2009. Site Visit Report: Proposed subdivision and development of portion 12 of Paapekuil Fontein 281, Cape Agulhas, Overberg. Report for and by Heritage Western Cape.

Figures and Plates (on following pages)

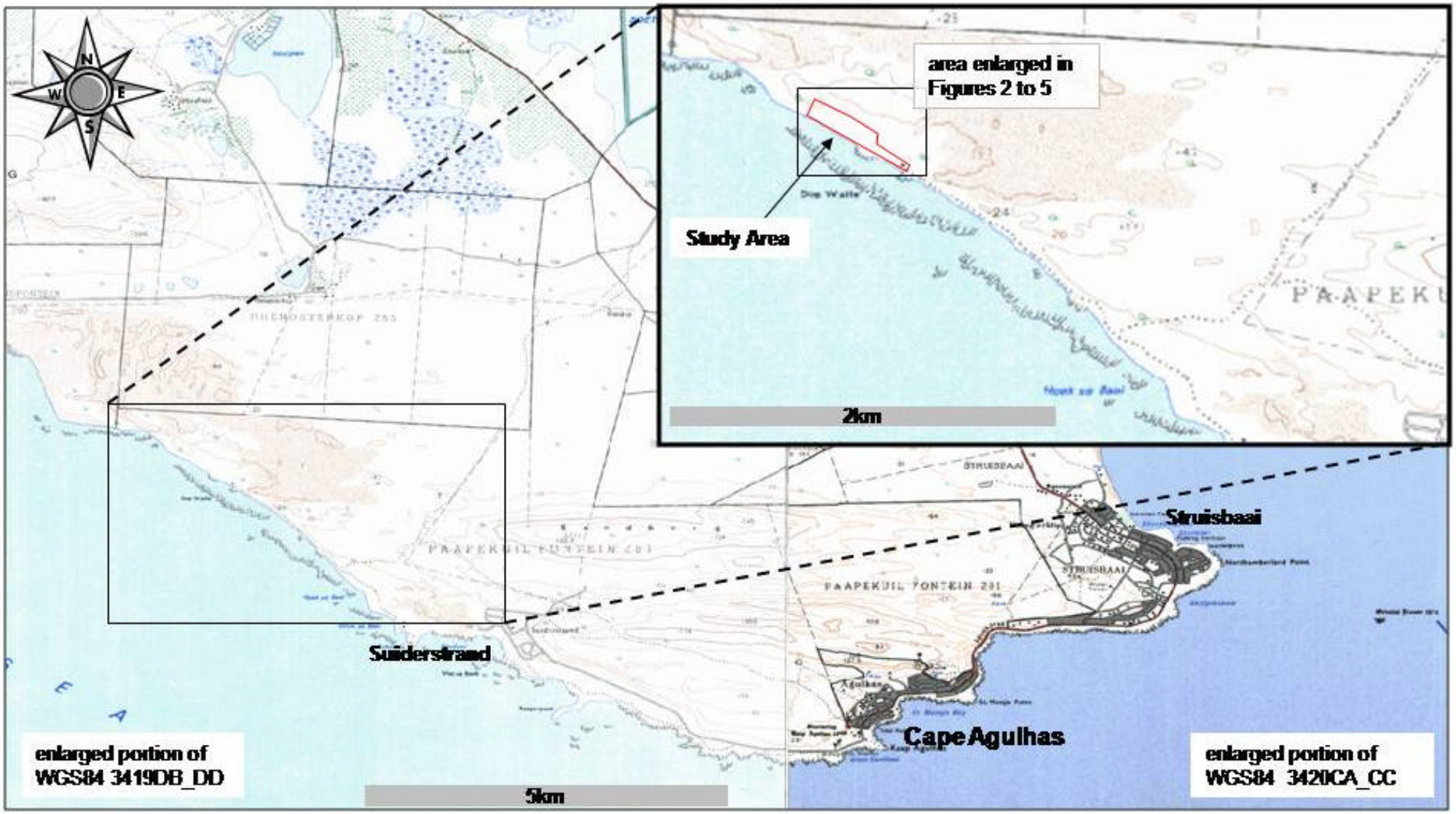

Figure 1. General location of study area relative to Cape Agulhas on the Cape south coast, Western Cape Province.

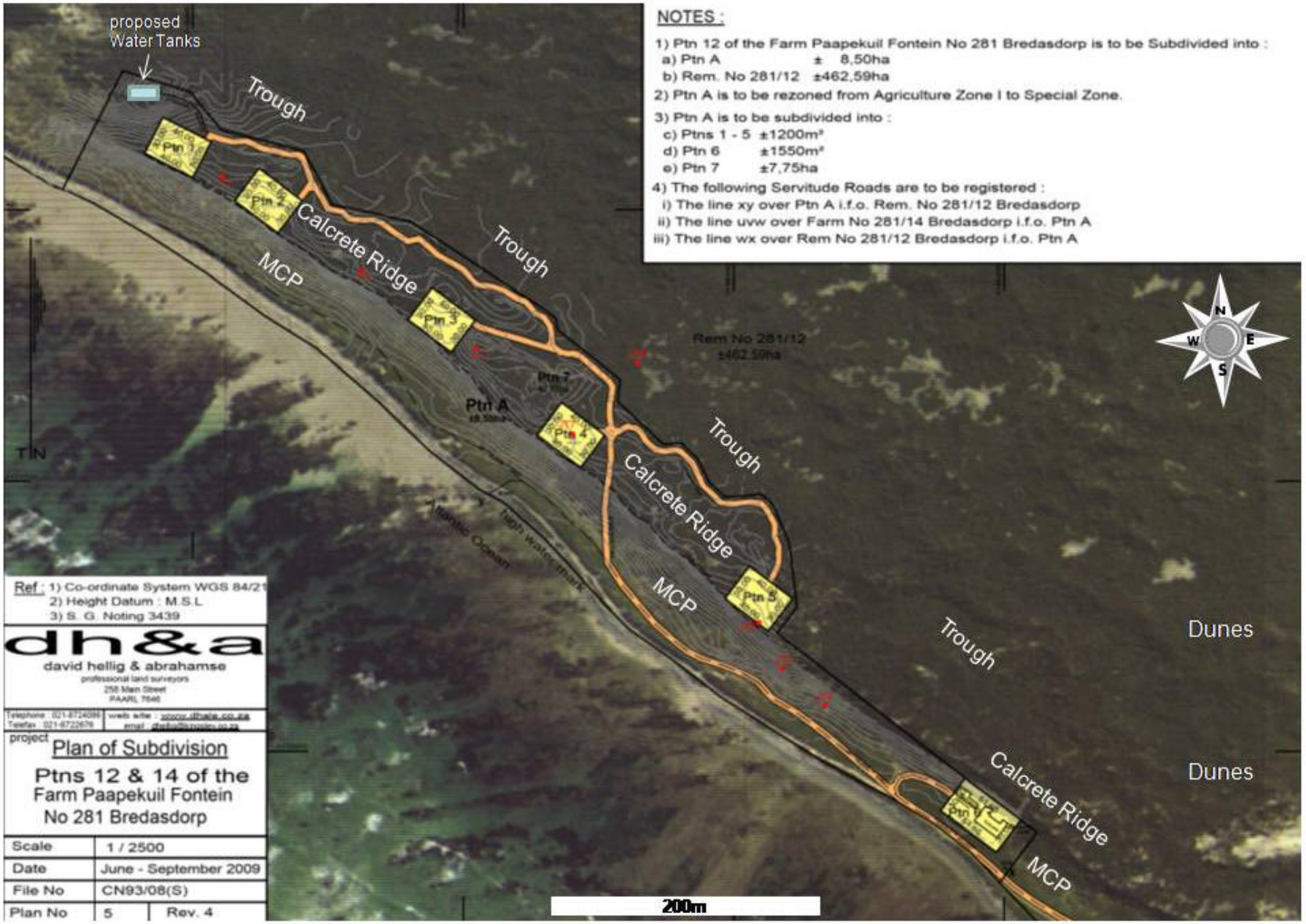

Figure 2. Layout plan for proposed development and three zones within study area.

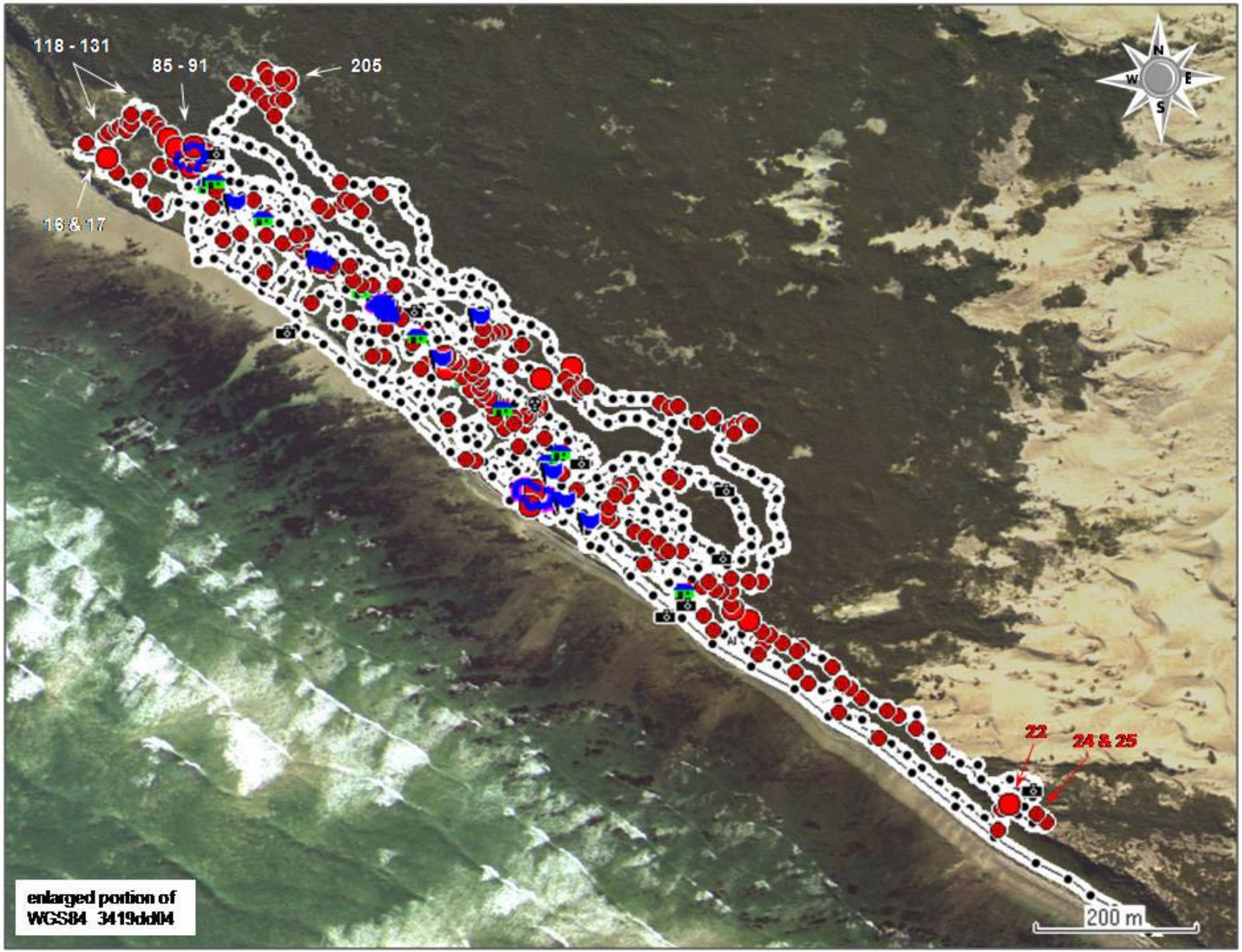

Figure 3. Full extent of the studied area (tracks & waypoints), indicating sites not shown in other overlays on aireal photos.

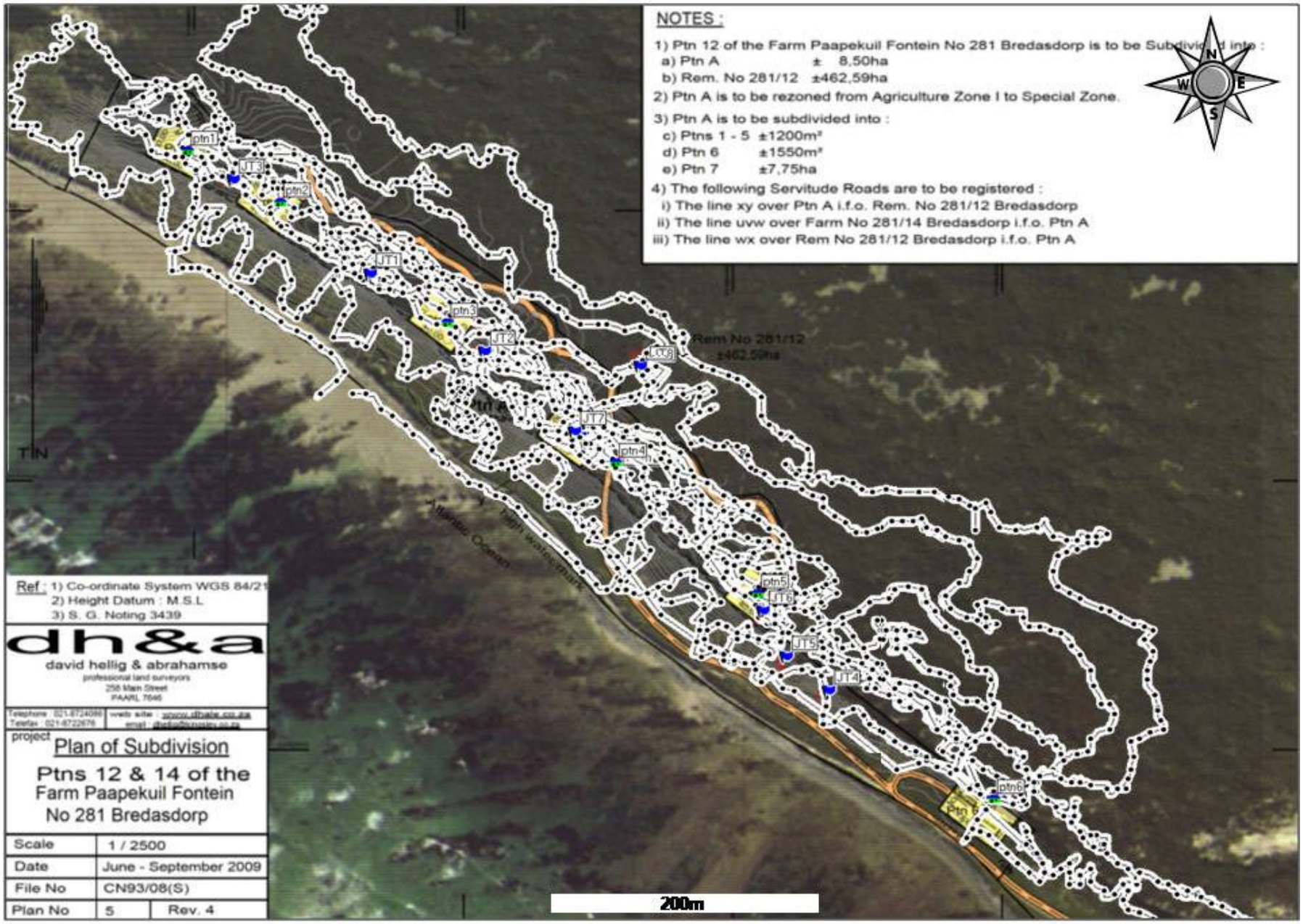

Figure 4. Walk tracks – fixed via GPS - of foot survey showing area covered. Also see Figure 3.

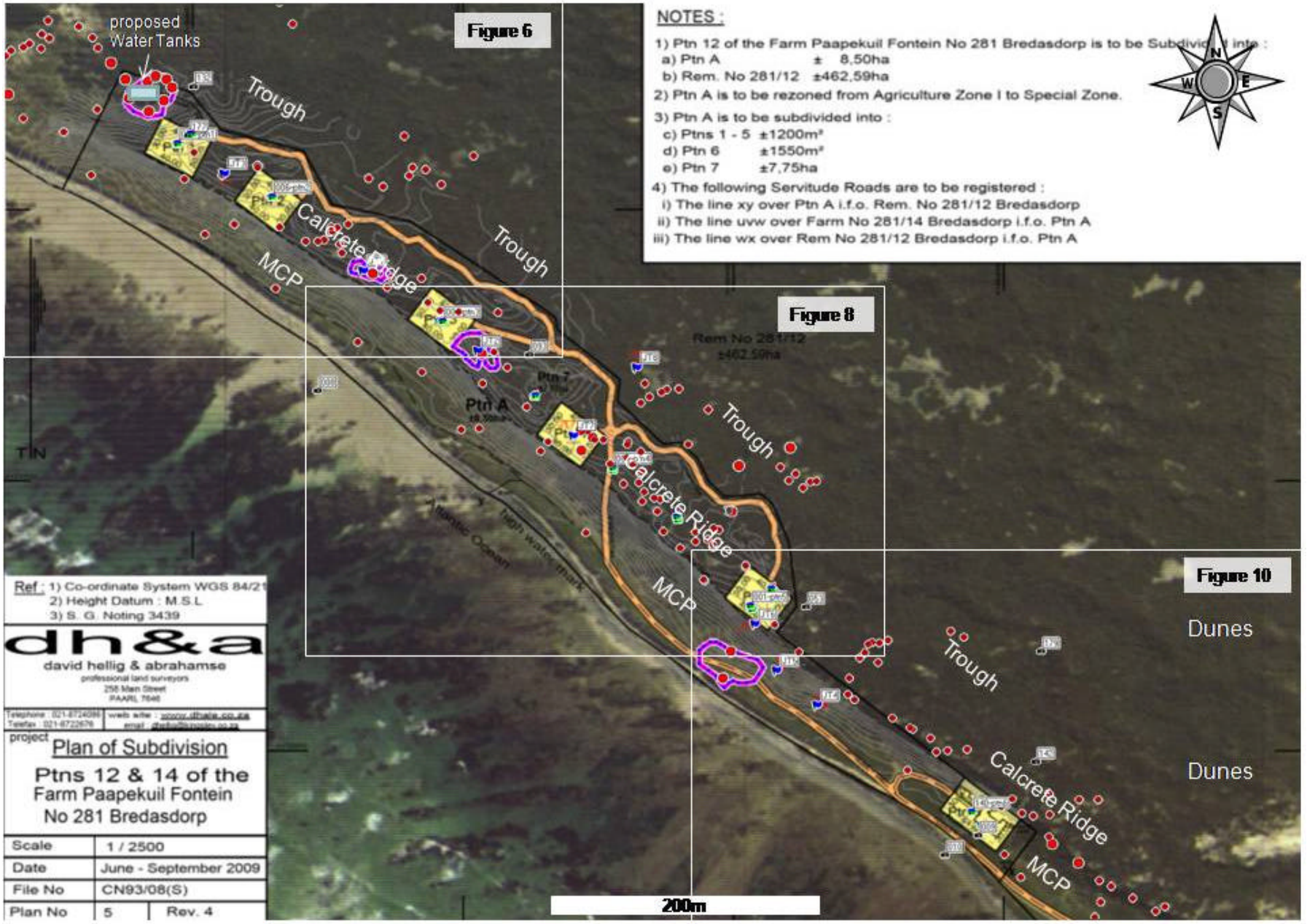

Figure 5. Overlay of waypoints (red dots, large red dots = significant sites) and extents of selected sites (purple & blue polygons). Also see Figure 3.

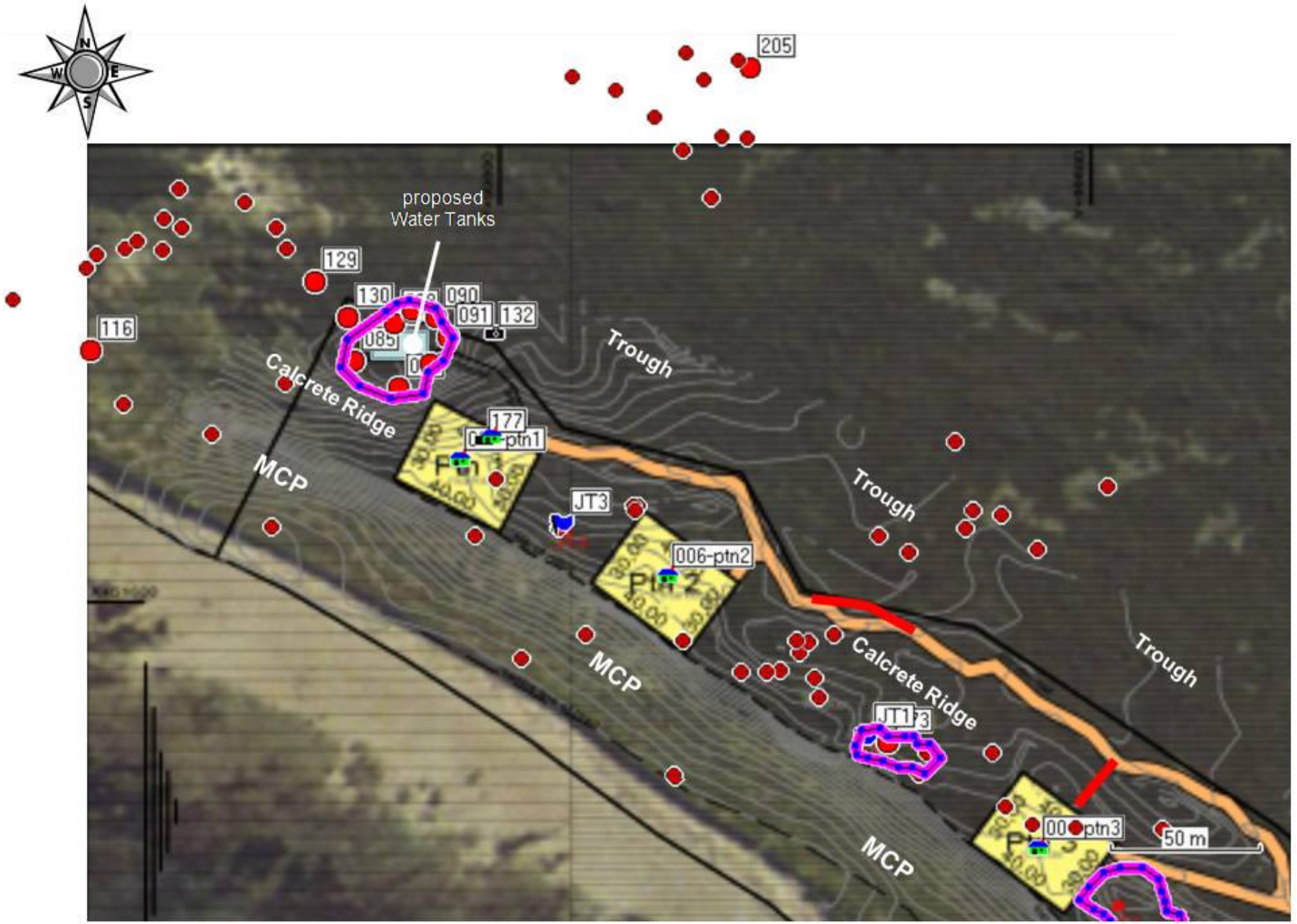

Figure 6. Enlarged area as indicated in Figure 5 showing development layout, occurrences & sites (red dots) and site boundaries (blue & purple lines).

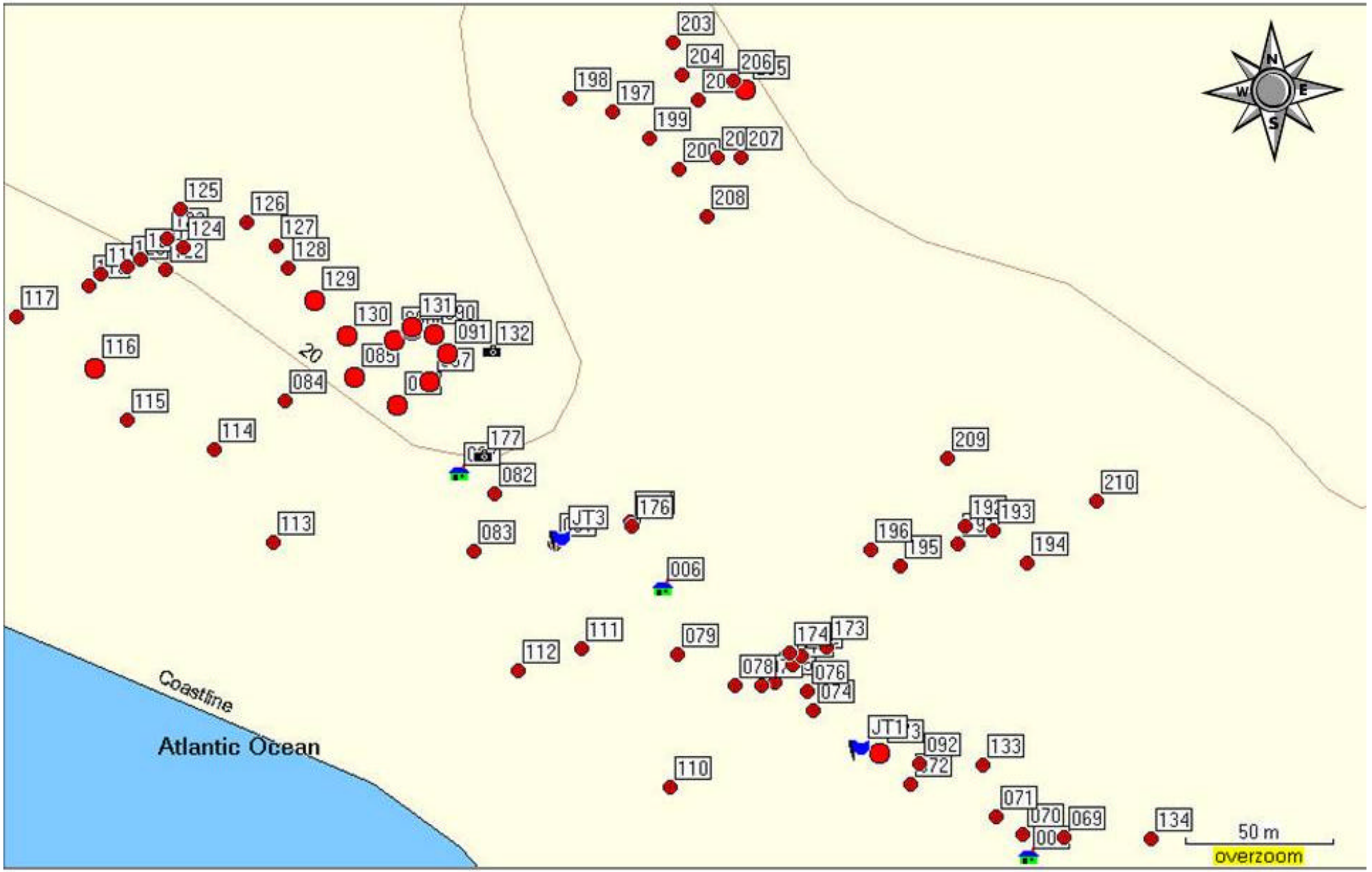

Figure 7. Enlarged area as Figure 6 showing all waypoints and names. For further details see text and refer to Table 1.

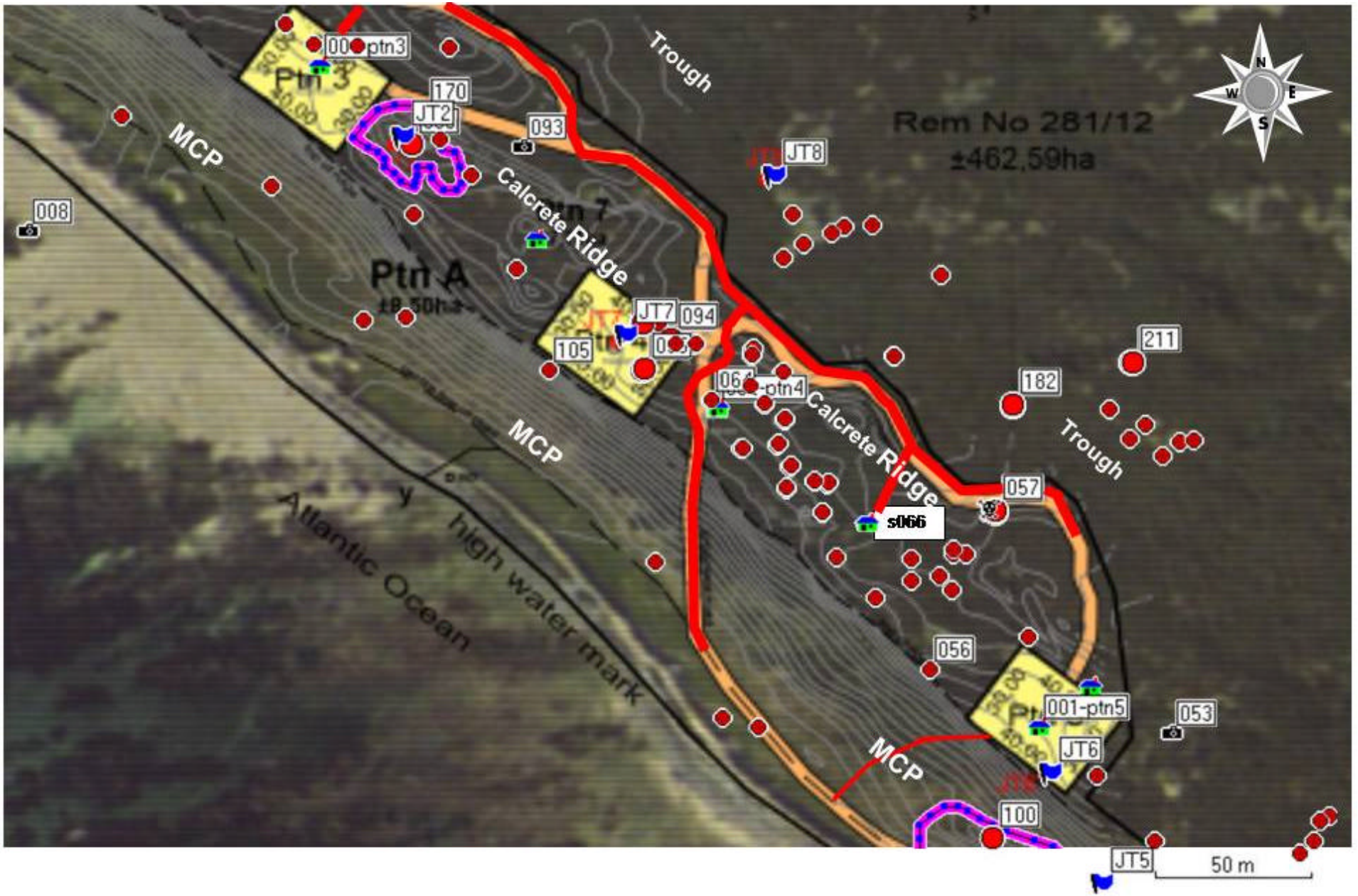

Figure 8. Enlarged area as indicated in Figure 5 showing development layout, occurrences & sites (red dots) site boundaries (blue & purple polygons) and proposed road and boardwalk alignments (thick and thin red lines respectively).

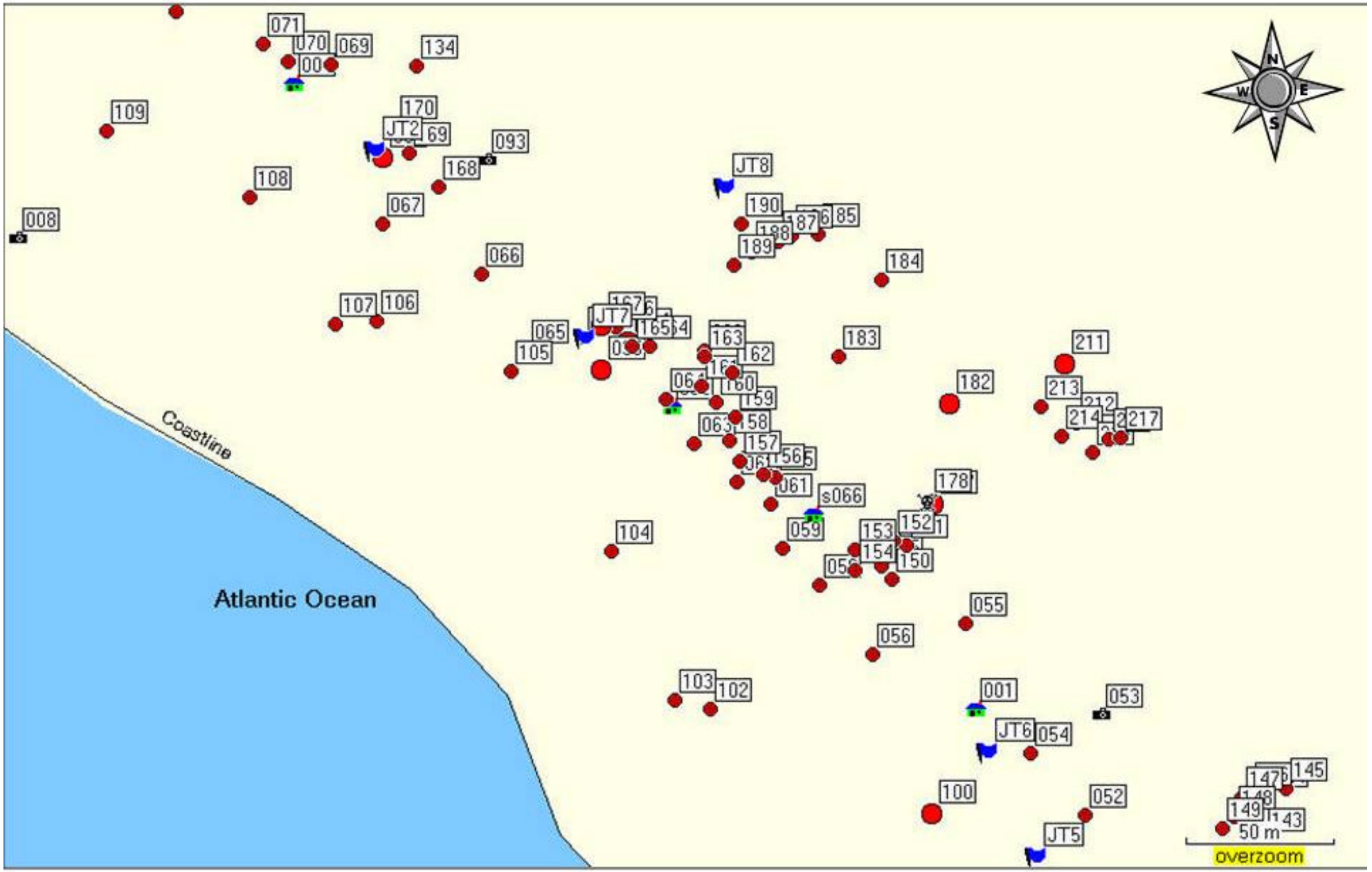

Figure 9. Enlarged area as Figure 8 showing all waypoints and names. For further details see text and refer to Table 1.

Figure 10. Enlarged area as indicated in Figure 5 with development layout, occurrences & sites (red dots) and site boundaries (blue & purple polygons).

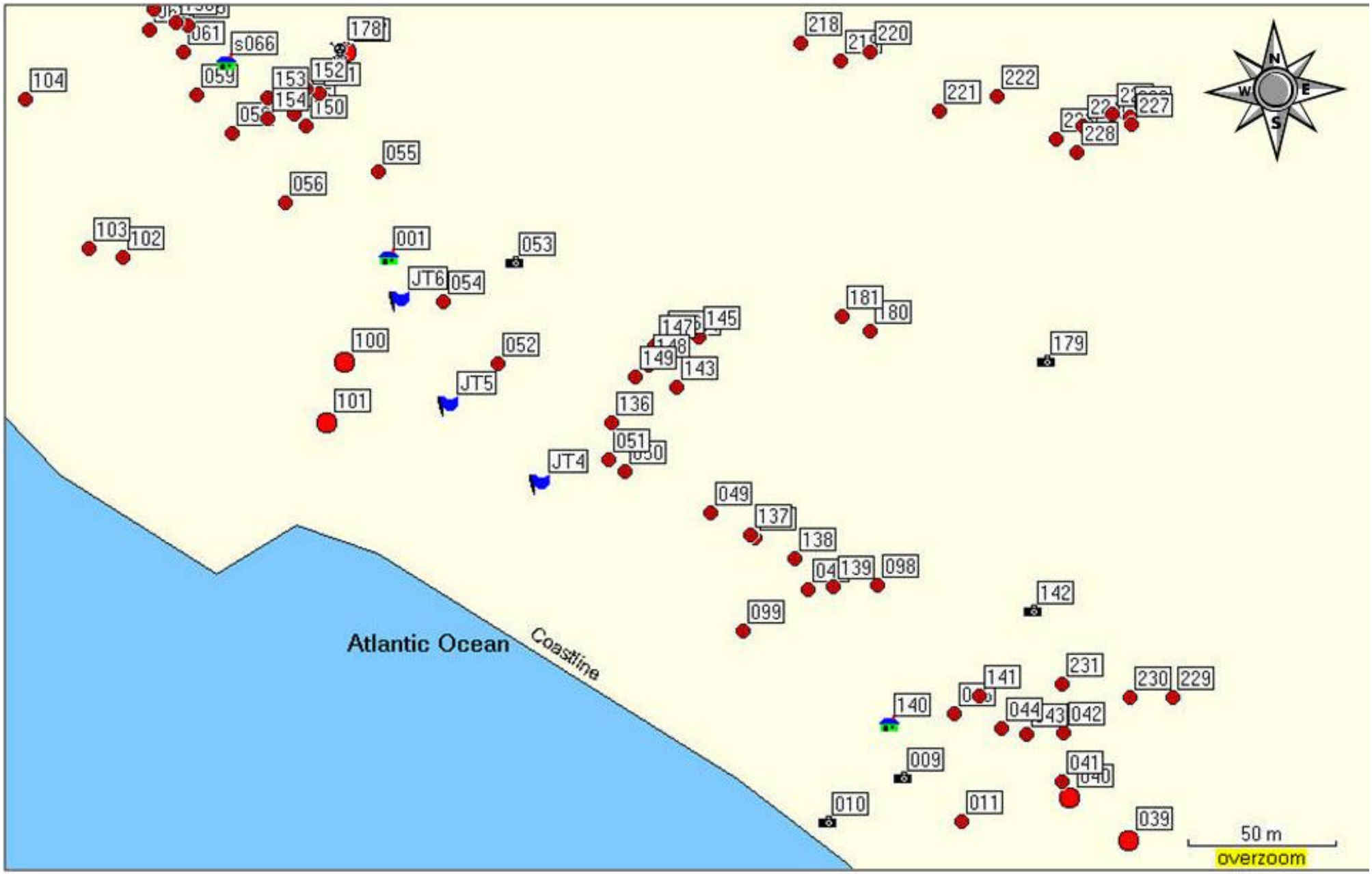

Figure 11. Enlarged area as Figure 10 showing all waypoints and names. For further details see text and refer to Table 1.

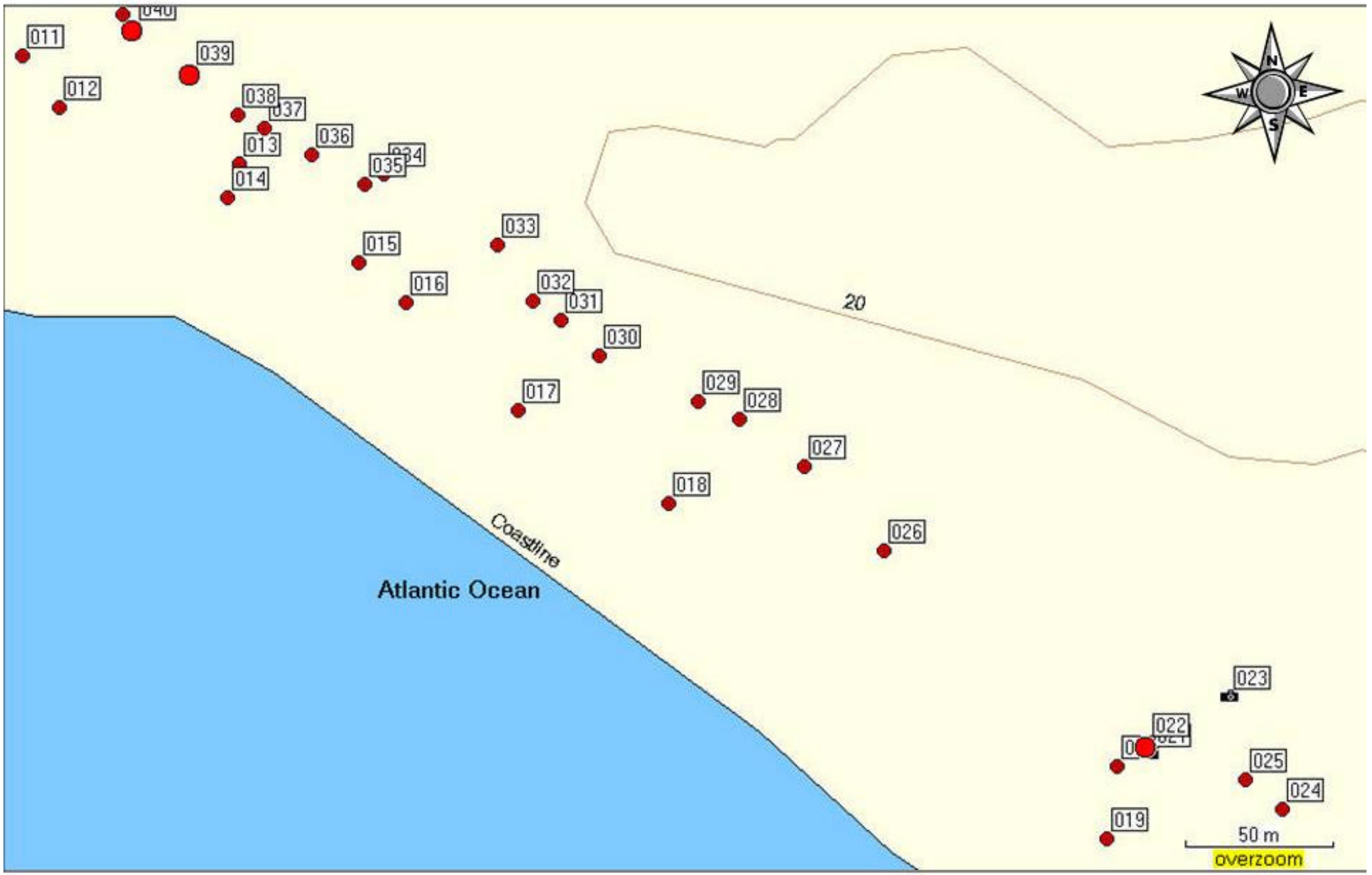

Figure 12. Enlarged area as Figure 10 showing all waypoints and names. For further details see text and refer to Table 1.

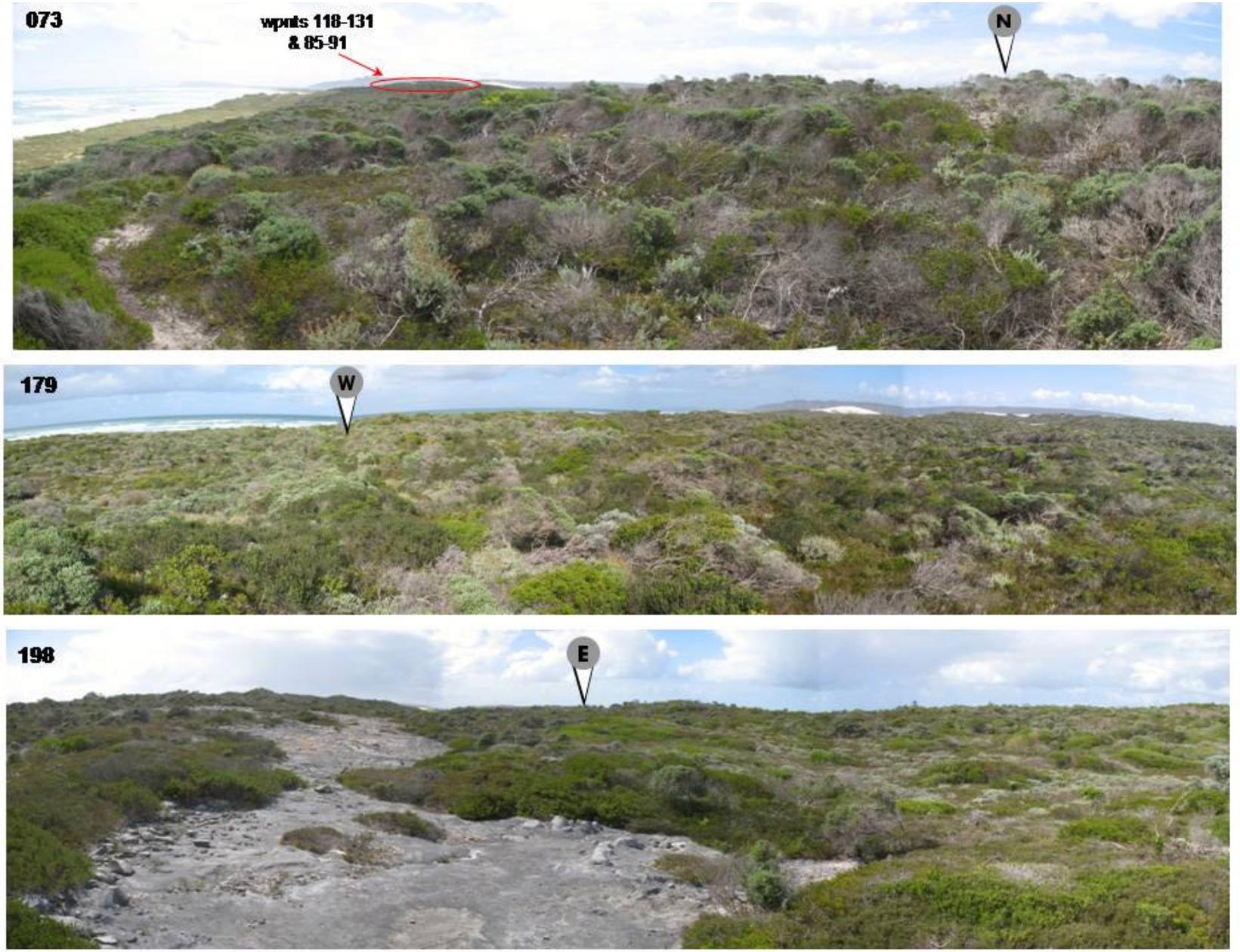

Plate 1. The study area showing topography, vegetation cover, exposed calcrete and position of waypoints. Numbers relate to waypoints – mostly archaeological occurrences - discussed in the text and/or listed in Table 1. Also see Figures. Bearing arrows indicate approximate direction of view.

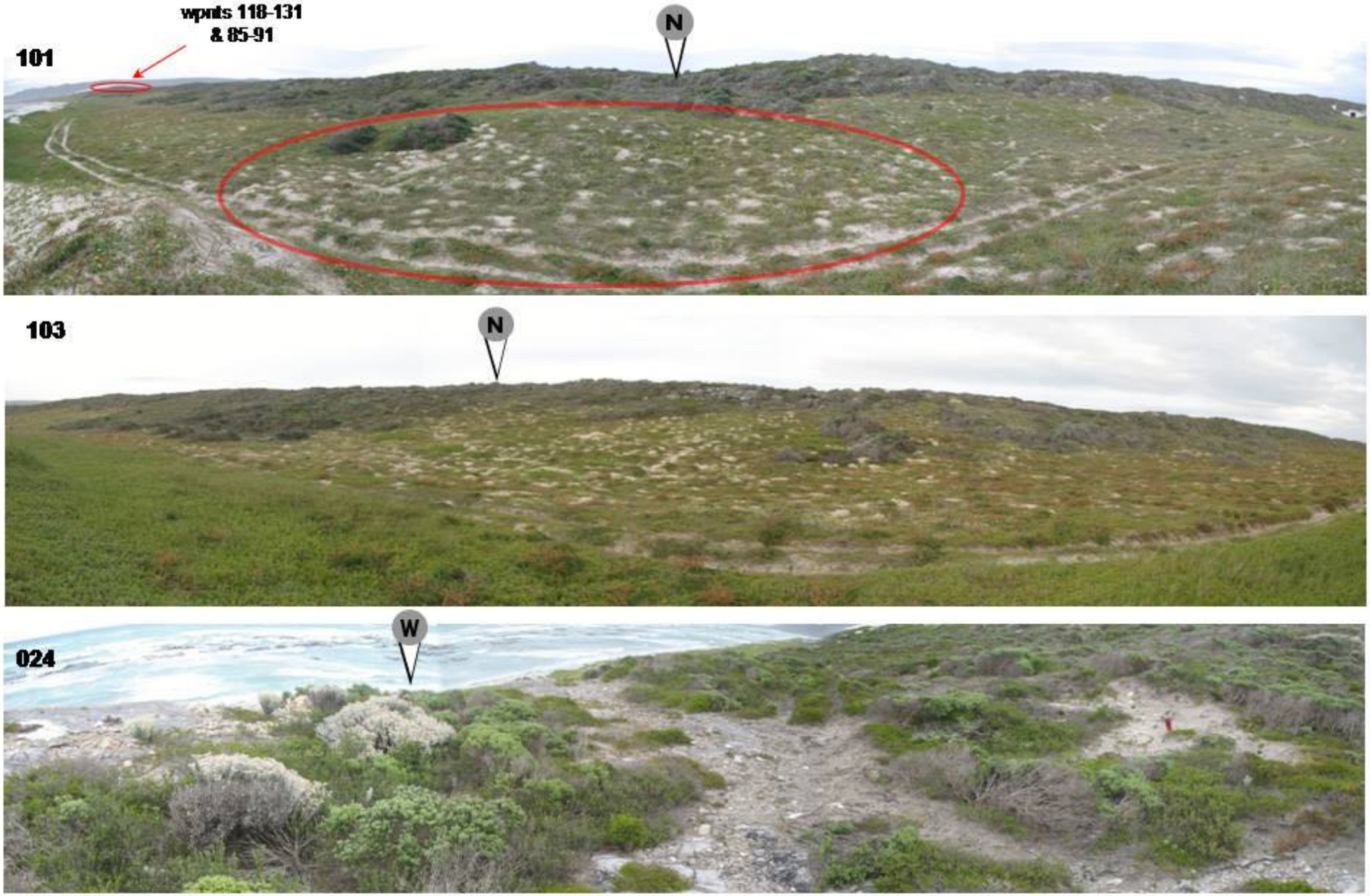

Plate 2. The study area showing topography, vegetation cover, exposed calcrete ledge, burrowing activity and position of waypoints. Numbers relate to waypoints – mostly archaeological occurrences - discussed in the text and/or listed in Table 1. Bearing arrows indicate approximate direction of view.

Plate 3. Old house in study area. To be dealt with in full by Mr. Nicolas Baumann. Bearing arrows indicate approximate direction of view.

Plate 4. The study area showing topography, vegetation cover, burrowing activity and focal point of site (red oval). Numbers relate to waypoints – mostly archaeological occurrences - discussed in the text and/or listed in Table 1. Also see Figures. Bearing arrows indicate approximate direction of view.

Plate 5. The study area showing topography, vegetation cover, exposed calcrete and focal point of site (red oval). Numbers relate to waypoints – mostly archaeological occurrences - discussed in the text and/or listed in Table 1. Also see Figures. Bearing arrows indicate approximate direction of view.

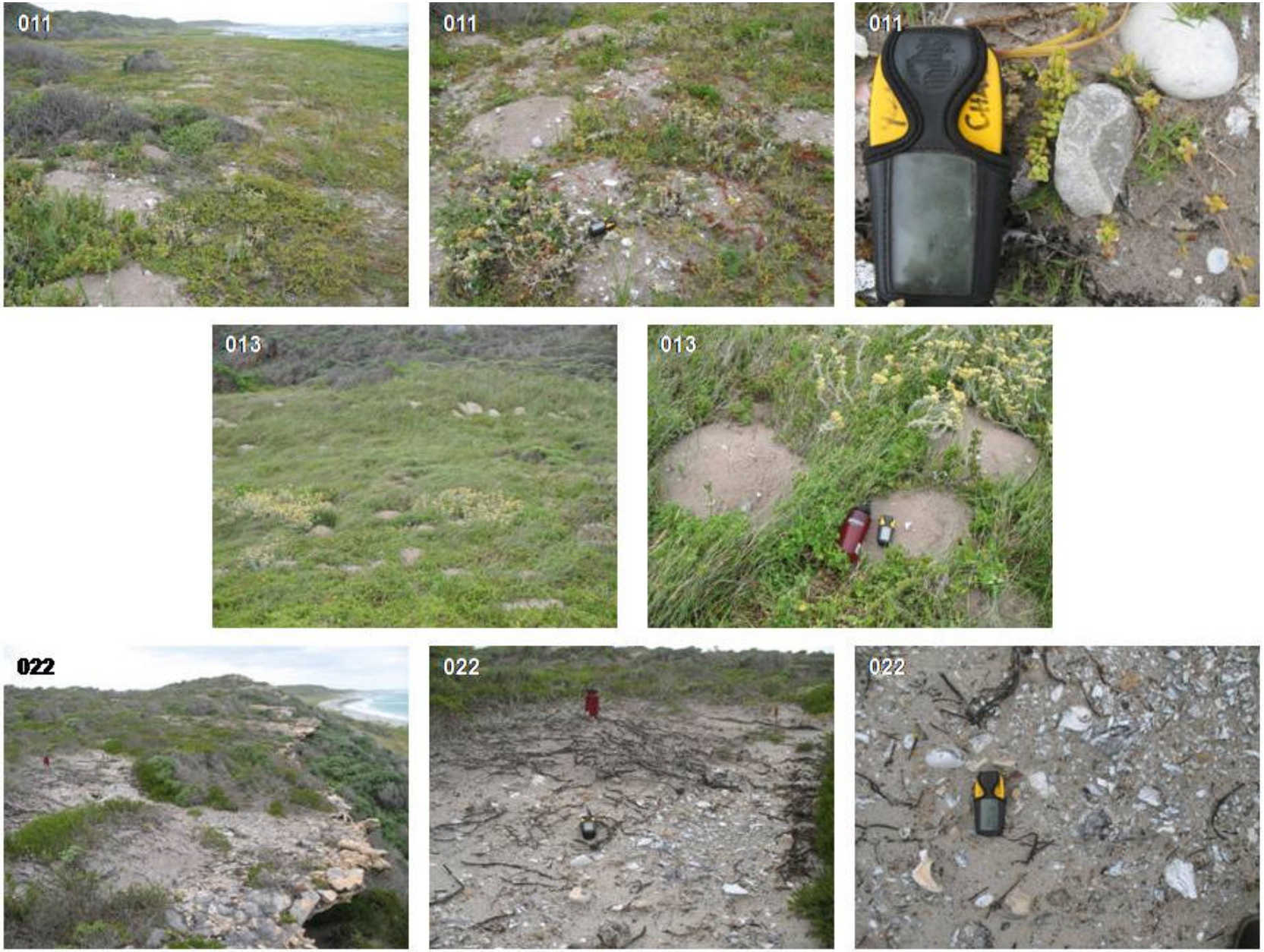

Plate 6. Examples of contexts, archaeological occurrences and finds. Numbers are waypoints – archaeological occurrences - see description and discussion in text and see Figures & Table 1. 1l bottle and Garmin GPS for scale.

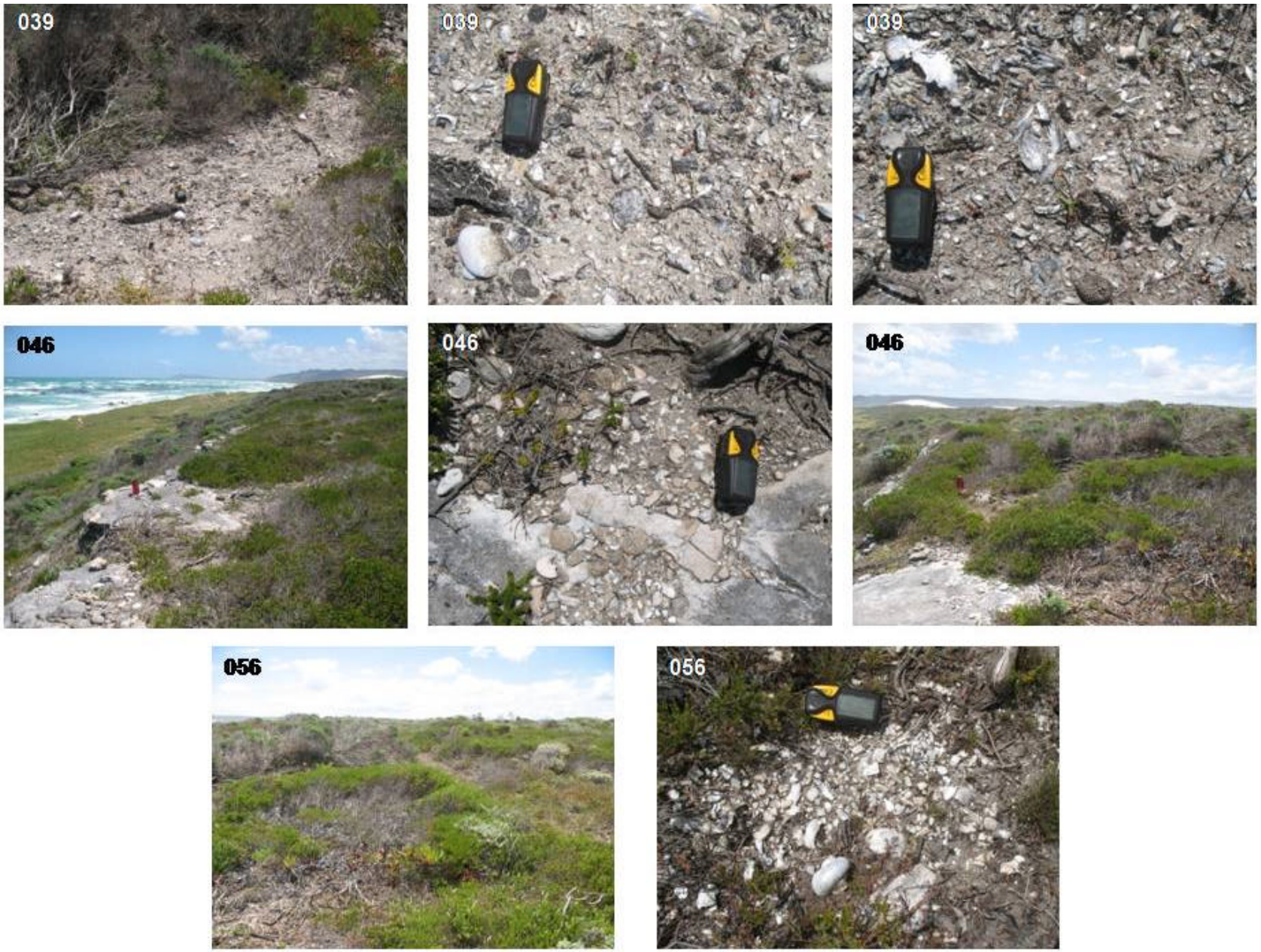

Plate 7. Examples of contexts, archaeological occurrences and finds. Numbers are waypoints – archaeological occurrences - see description and discussion in text and see Figures & Table 1. 1l bottle and Garmin GPS for scale.

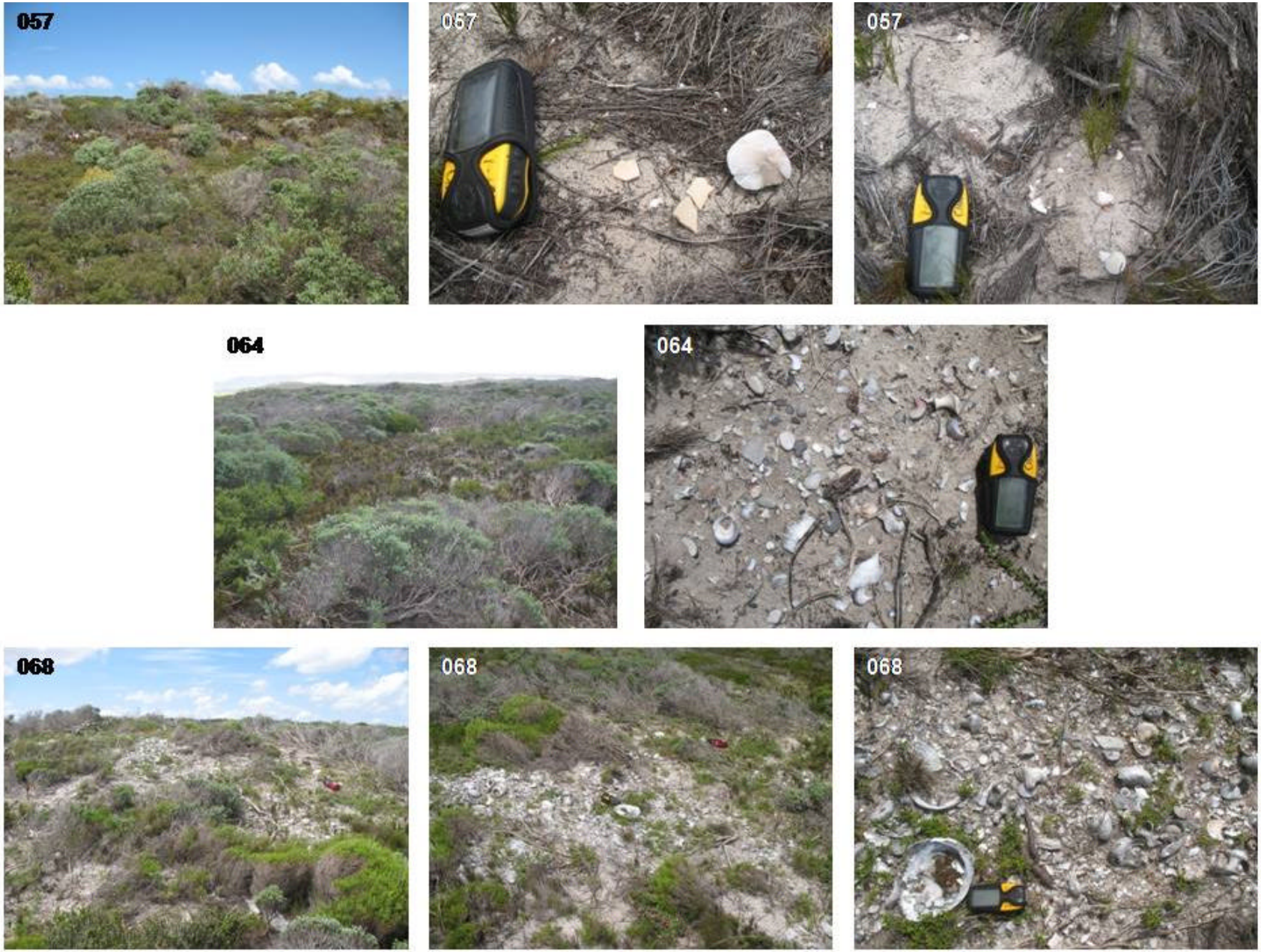

Plate 8. Examples of contexts, archaeological occurrences and finds. Numbers are waypoints – archaeological occurrences - see description and discussion in text and see Figures & Table 1. 1l bottle and Garmin GPS for scale.

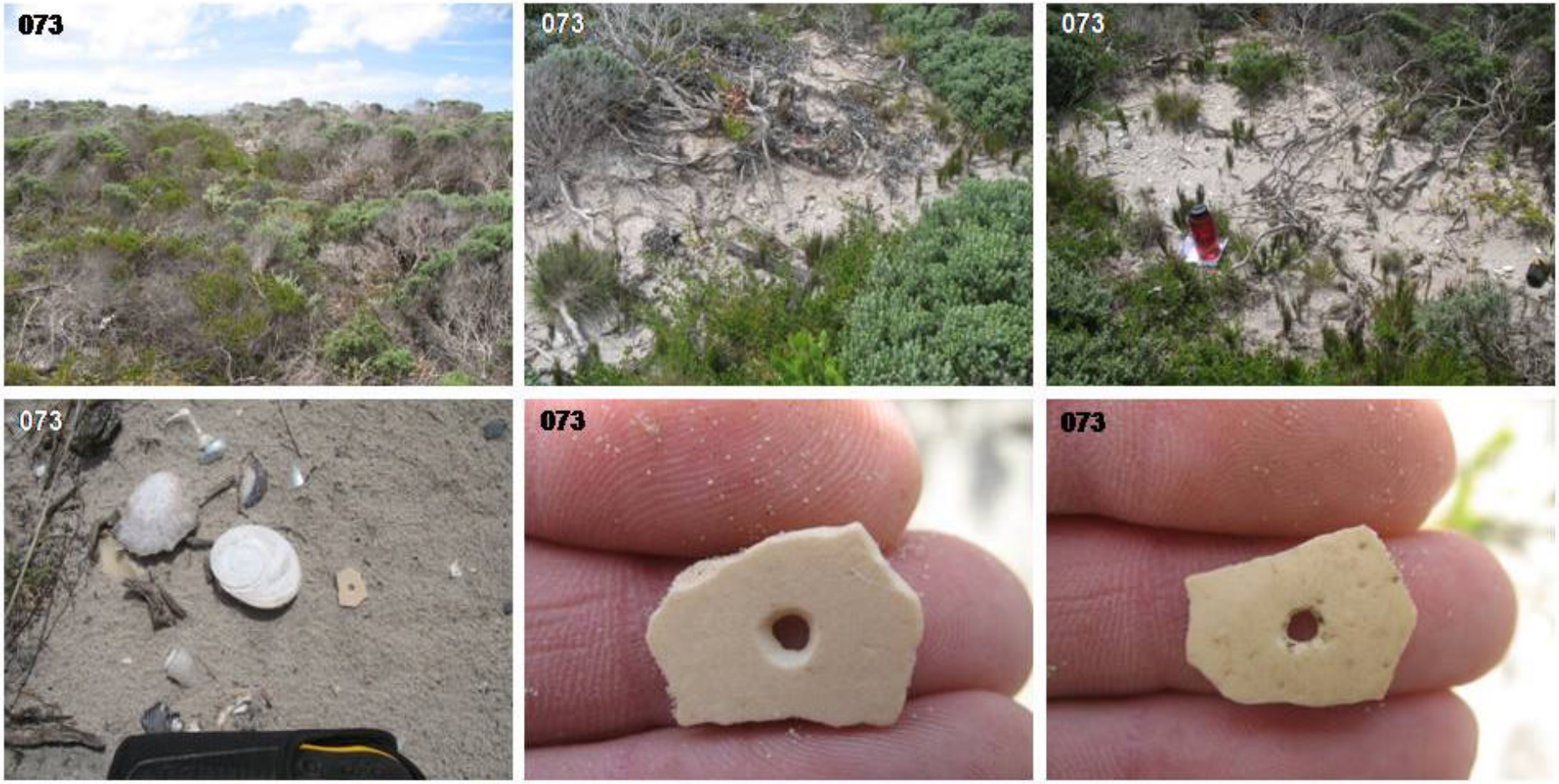

Plate 9. Example of context, archaeological occurrences and finds including an unfinished ostrich egg shell bead drilled from both sides. Number refers to waypoint – archaeological occurrence - see description and discussion in text and see Figures & Table 1. 1l bottle and Garmin GPS for scale.

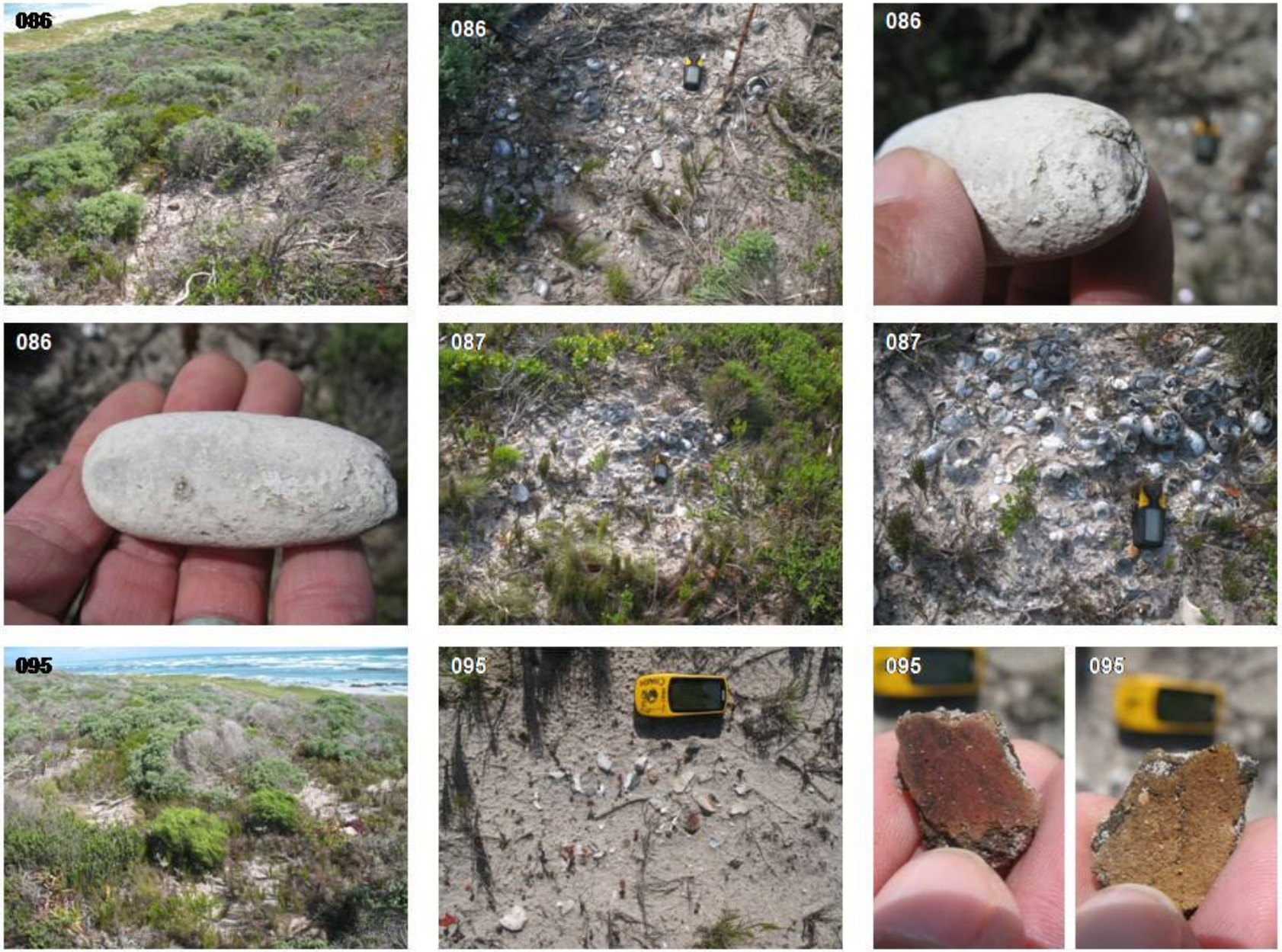

Plate 10. Examples of contexts, archaeological occurrences and finds including a small hammer stone and quartz tempered pottery. Numbers are waypoints – archaeological occurrences - see description and discussion in text and see Figures & Table 1. 1l bottle and Garmin GPS for scale.

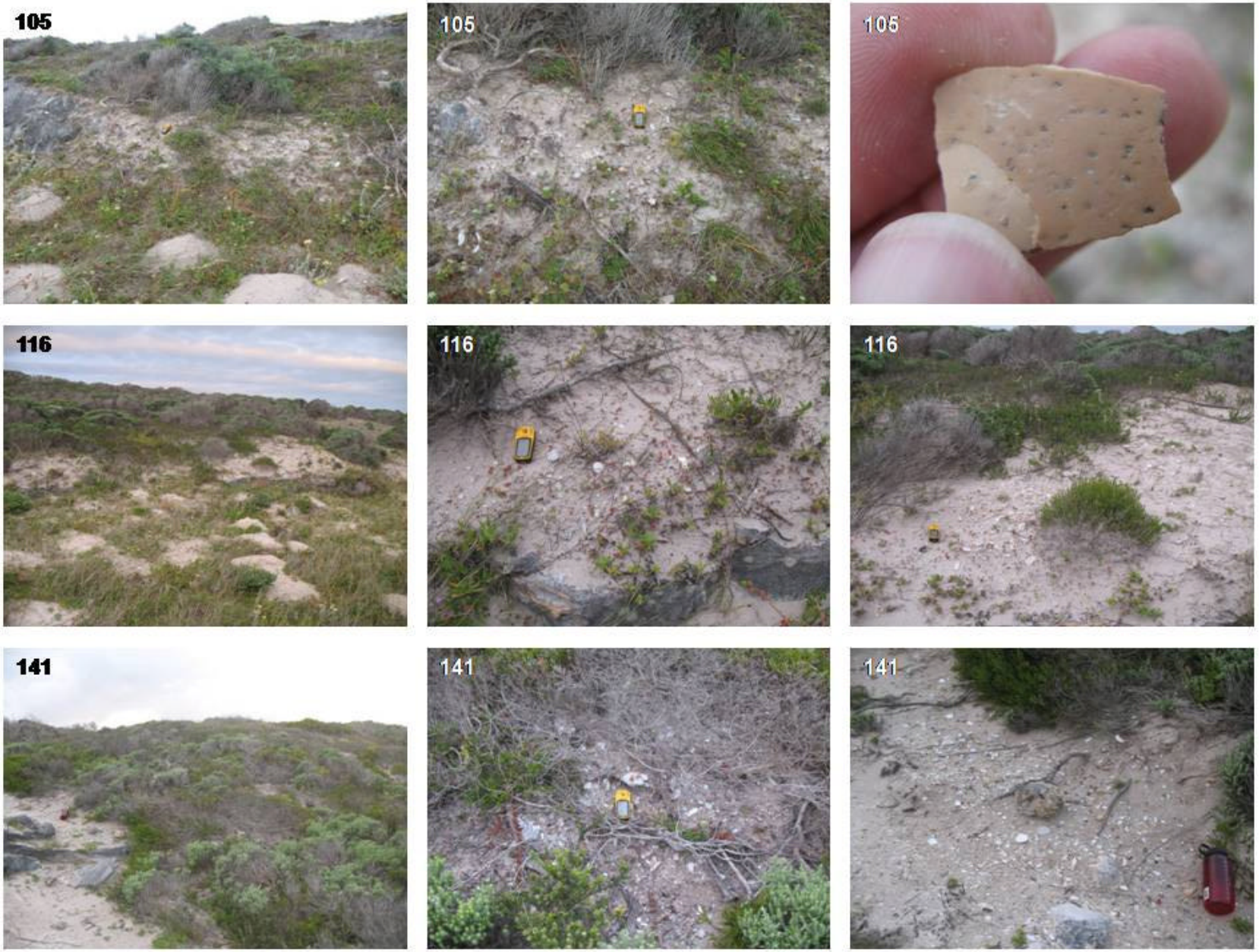

Plate 11. Examples of contexts, archaeological occurrences and finds including a fragment of ostrich egg shell. Numbers are waypoints – archaeological occurrences - see description and discussion in text and see Figures & Table 1. 1l bottle and Garmin GPS for scale.

Plate 12. Examples of contexts, archaeological occurrences and finds including a unifacial quartz core. Numbers are waypoints – archaeological occurrences - see description and discussion in text and see Figures & Table 1. 1l bottle and Garmin GPS for scale.

Plate 13. This is a site of high local and medium regional significance that includes large numbers of artefacts in quartz and a few in quartzite. Waypoint 182 is described and discussed in the text and see Figures & Table 1. Garmin GPS for scale.

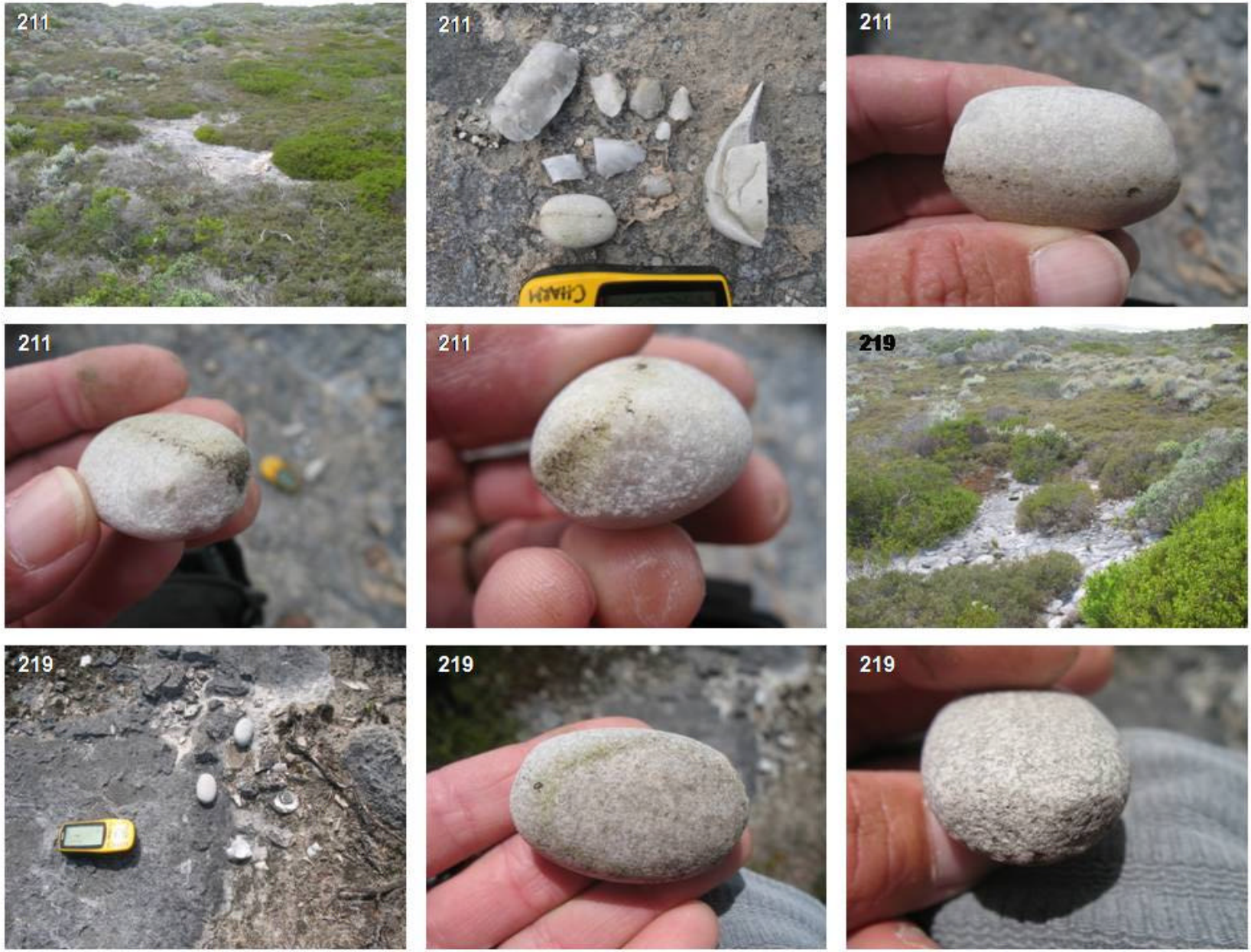

Plate 14. Examples of contexts, archaeological occurrences and finds including quartz and quartzite artefacts and small hammer stones in quartzite. Numbers are waypoints. See description and discussion in text and see Figures & Table 1. 1l bottle and Garmin GPS for scale.

APPENDIX A: Table 1

Table 1. Recorded data for observations, archaeological occurrences and site boundaries.

Table 1 (continued)**. Recorded data for observations, archaeological occurrences and site boundaries.**

Table 1 (continued)**. Recorded data for observations, archaeological occurrences and site boundaries.**

Table 1 (continued)**. Recorded data for observations, archaeological occurrences and site boundaries.**

Table 1 (continued)**. Recorded data for observations, archaeological occurrences and site boundaries.**

Table 1 (continued)**. Recorded data for observations, archaeological occurrences and site boundaries.**

Table 1 (continued)**. Recorded data for observations, archaeological occurrences and site boundaries.**

Table 1 (continued)**. Recorded data for observations, archaeological occurrences and site boundaries.**

Table 1 (continued)**. Recorded data for observations, archaeological occurrences and site boundaries.**

Table 1 (continued)**. Recorded data for observations, archaeological occurrences and site boundaries.**

Table 1 (continued)**. Recorded data for observations, archaeological occurrences and site boundaries.**

Table 1 (continued)**. Recorded data for observations, archaeological occurrences and site boundaries.**

Table 1 (continued)**. Recorded data for observations, archaeological occurrences and site boundaries.**

Table 1 (continued)**. Recorded data for observations, archaeological occurrences and site boundaries.**

Table 1 (continued)**. Recorded data for observations, archaeological occurrences and site boundaries.**

Table 1 (continued)**. Recorded data for observations, archaeological occurrences and site boundaries.**

Table 1 (continued)**. Recorded data for observations, archaeological occurrences and site boundaries.**

Table 1 (continued)**. Recorded data for observations, archaeological occurrences and site boundaries.**