

Review D. Kirkwood 2023/08/25

Overall – important and valuable foundational research paper, with appropriate and high quality methodology, analysis and conclusions. Field survey based veg analyses are hugely time-consuming and as a result not nearly enough of our globally exceptional flora is delineated using evidence based methods and this paper sets an excellent standard, and provides a solid foundation for delineation of better units, unit descriptions and mapping of boundaries than the original substrate+expert 2006 SA Vegmap units. The approach also aims to not disrupt existing boundaries where not justified. Should other experts disagree with any delineation, background, methods and results are transparently presented supporting consensus and resolution.

I have made a number of clarity/style suggestions below which I would consider optional and found a few minor typos. I would be comfortable with accepting without any required changes other than the following two issues which I think require author review/clarification:

- 1) Critical issue: 463 South Coast Strandveld concept and discussion in relation to Vegmap terminology

466-468 I'm very confused here – There does not seem to be such a thing as 466 Rebelo et al 2006 South Strandveld Bioregion. Rebelo 2006 mentions South Coast Strandveld, but only describes South Coast Strandveld briefly on page 76 (just before their section 3.4 Fynbos Thicket) indicting Moll et al 1984 dichotomy between West Coast Strandveld and South Coast Strandveld and that their classification “builds on this” which doesn't seem to actually have been incorporated in the vegmap bioregions or concepts - the only bioregion within the Fynbos Biome section described with units allocated is for Western Strandveld (summary table Fynbos section page 55) – I can find no set of units assigned to a South Coast Strandveld bioregion here or elsewhere in Rebelo section or overall Mucina et al 2006 Vegmap. Other coastal units corresponding to a Strandveld or Dune veld concept are within other major biomes or bioregions as noted on line 468-9 for Algoa Dune Strandveld. This seems to be a poor naming convention within the original vegmap publication (western is indeed an odd choice for units extending onto the South Coast – and there is a nod to this on page 198 as the final para for their section 9.3 Western Strandveld.). Nonetheless, please confirm and clarify as this has an important implication – in that this publication is proposing defining a new and separate bioregion separate from Western Strandveld, and the key floristic differences at bioregion level then need to be addressed. My confusion is furthered by use of West Strandveld on line 488

- 2) Less important conceptual issue

As per conclusion 979 The vegetation of the Holocene dunes of the Cape south coast form a coherent geo-botanical unit, “

However no other non-Strandveld or more western Strandveld survey areas were included in analyses, so this conclusion of vegetation coherence should be presented in that context. That does not take anything away from the very high value of surveying, analysing and redefining the units within the study area, but may unduly influence future work aligning or separating surrounding areas. E.g. it is possible that Cape Peninsula and surrounding units when properly surveyed and compared to this data set, may align more closely with the presented South Coast Strandveld concept than the existing Western Strandveld concept.

- 3) Request – upload electronic GIS files of newly mapped units with publication resources.

Basic Reporting – excellent

In general the paper is clear but English used is sometimes a tad complex and includes some jargon that could be avoided. Given that the potential wide audience that would benefit from this work includes many non-academics who may struggle to read and absorb meaning easily, I've made a few suggestions below. None are critical and I would not be concerned if you prefer to ignore them.

368 Data Analysis

Clear and concise – There are many approaches to ordination but methods are appropriate and specifics are uncontentious given the very clear patterns and associations revealed.

Specific text/clarification suggestions & comments:

It's not completely clear what is meant by "Notwithstanding floristic coherence throughout the Cape south coast" - I assume this refers to a subjective view that there is a recognisable species assemblage with minimal internal turnover and distinct differences from surrounding floras, but I think given the useful evidence based approach of the paper, this could be clarified?

Consider moving para lines 85-95 to front of intro

Line 60 – consider substituting "extent" or "total area" instead of "distribution"

Line 80 – could delete word "accommodation"

Line 94 I think "least threatened" should be Capitalised to conform to typical SA cons planning usage?

Line 98 " consider substituting "biased" instead of "slanted" which made me think it might be a stratigraphy description. "The 98 assignment of stratigraphic units was traditionally slanted towards bedrock in the compilation of 99 geological maps in South Africa" might be clearer as "The 98 assignment of stratigraphic units was traditionally **biased** towards bedrock **types** in the compilation of 99 geological maps in South Africa"

Line 104-106 is clear in meaning but may be inaccessible to less academic readers: my understanding is that you are saying "clearly identifiable plant assemblages on specific Cenozoic deposits provide a reliable indicator of sediment age now that these plant communities are objectively delineated".

General – I, like many people, cannot easily remember my geological periods – consider including a little box covering the relevant definitions at the start of section Biophysical Setting/Geology and Dune Sediments line 117. Understanding of this whole section would be greatly assisted by illustrative map/s if possible, but I understand that this would be very time consuming to compile or very indicative due to no comprehensive spatial data sets delineating the features described.

No change needed – just a note that I am very pleased to see the strong emphasis that existing veg mapping is heavily influenced by tendency for consolidated sediments to have been mapped, ignoring overlying unconsolidated stuff that drives plant community composition, and providing necessarily detailed descriptions of these surface level deposits in this publication.

127 “embayments” is not a commonly understood use of oceanic bays, consider reword for clarity, maybe just “bays”

141-2 could reword for clarity and simplicity ? – most of the current extent of those deposits are currently on the continental shelf seafloor/underwater

209-215 – it’s not clear which references that section of substrate description are cited from ?

Flora and Vegetation

240 are they really as rich as CFR hinterland flora on average? Or would this be better worded as “as rich as many CFR hinterland floras” or is the meaning meant to be hinterland floras globally?

250-252 – it might not be clear to someone not already familiar with Grobler 2020 that the high richness relates to the large extent of that habitat that would have been exposed during Pleistocene glacials over evolutionary time relative to the current squeezed coastal extent. Since it’s such a critical concept here, I would encourage rewording and checking for understanding with a layperson.

258-9 could be consolidated into para from 262 to improve readability?

301 – I would go further than “several” and say any of “clear / multiple / many”.

396 Vegetation mapping

Should the GIS files mapped not be included with this publication?? There is some subjectivity in this process – areas where existing VEGMAP units or boundaries were confirmed would also be very valuable to include as attribute field or separate data set.

Line 412 typo – “**Similarl** to mapped forests”

Results and Discussion

425 – typo: “**stranveld**” and not consistent with later Capitalisation of Strandveld?

432- would it be possible to very quickly characterise the source of the Sandveld sediments? – otherwise the description implies that they are also mostly sands of marine origin whereas (open to correction – I’m pretty clueless about this) they may be more aeolian from sandstone and other inland deposits in addition to marine influence.

582 – should *Crassula muscosa* be called/included as a prominent shrub? I would think it’s a succulent herb albeit sometimes a big one. Life form descriptions are a mess though so wouldn’t worry too much about this.

585-6 what does “best represented” mean? Dominant? Widespread and dominant?

582 likewise “prominent” – does that refer to conspicuous or high cover/dominance?

552 on – related to previous – I would encourage more consistent terminology w.r.t. characteristic species that would allow users to differentiate between characteristic i.e. differential species and dominant species, even if this is boring and repetitive between units. Fig 4 does a great job clarifying however so this may be less important.

769 redact “thus far”, typo correct “suggest” to suggests

1242 – reference should read pages 53-219

