Revising Holocene Strandveld types (FS7,8 & 9,AT36 & 57)

Technical proposal by Anisha Dayaram on behalf of authors of **The vegetation of Holocene coastal dunes of the Cape south coast, South Africa**

PeerJ

The vegetation of Holocene coastal dunes of the Cape south coast, South Africa

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Table 2 Correspondence between South Coast Strandveld units described in this study and corresponding National Vegetation Map (VEGMAP) units. VEGMAP units were described by *Mucina et al. (2006a)*, *Mucina et al. (2006b)*, *Rebelo et al. (2006)* and *Grobler et al. (2018)*.

VEGMAP 2006	Notes	VEGMAP 2018	Notes	This study
Overberg Dune Strandveld (Fynbos Biome)	Grootbos Strandveld not recognised as a separate unit	Overberg Dune Strandveld (Fynbos Biome)	Grootbos Strandveld not recognised as a separate unit	Southwestern Strandveld Grootbos Strandveld
Blombos Strandveld (Fynbos Biome)	Coincides with the eastern part of Southwestern Strandveld	Blombos Strandveld (Fynbos Biome) Hartenbos Dune Thicket (Subtropical Thicket Biome)	All mapped as Hartenbos Dune Thicket (Subtropical Thicket Biome) except for a sliver between Duiwenhoks and Breede rivers; most Hartenbos Dune Thicket on Mid Pleistocene aeolianites	Southwestern Strandveld
Groot Brak Dune Strandveld (Fynbos Biome)	Coincides with the western part of Southeastern Strarndveld	Groot Brak Dune Strandveld (Fynbos Biome)	Minor coincidence with Strandveld; most mapped on Mid Pleistocene aeolianites and other substrata	Southeastern Strandveld
Southern Cape Dune Fynbos (Fynbos Biome)	Classified as a form of Sand Fynbos associated with neutral to acid sands on Pleistocene aeolianites; In Cape St Francis area, mobile (late Holocene) dunefields are mapped as this type whereas the vegetation on earlier Holocene aeolianites are mapped as Algoa Dune Strandveld	Goukamma Dune Thicket and St Francis Dune Thicket (Subtropical Thicket Biome)	Mapped area extends on to Mid- Pleistocene and Neogene aeolianites	Goukamma Strandveld St Francis Strandveld (in part)
Algoa Dune Strandveld (Azonal Coastal Biome)	Classified as a form of Eastern Strandveld, an azonal coastal vegetation	St Francis Dune Thicket (Subtropical Thicket Biome)	Extends beyond Cape Recife to include thicket on Holocene Dunes and Neogene aeolianites	St Francis Strandveld Southeastern Strandveld

Compiled 20/12/2023

Background and Literature

Strandveld types were included in 2006 version of the National Vegetation Map and split across various bioregions and biomes in the VEGMAP Project hierarchy. In NVM the revision of the Thicket Biome used the STEP map and some of the strandveld types were consolidated under the thicket biome. There has been much debate about the correct assignment and delineation of these important regions and the paper Cowling et al 2023 is an important contribution to address these questions. The paper is detailed and neatly fits within the requirements for a proposal to make changes to the National Vegetation Map. As such this report is brief and mainly reviewers are requested to read the paper itself. We include below a short summary of the changes proposed at the implications of these changes for the NVM. Spatial data indicating the proposed changes are included for your review here:
https://drive.google.com/drive/folders/1eDf0WtNEyZKmXll8TXuQ6Y8U6rM3kRi9?usp=sharing

The paper is attached but all data can be accessed online here (opensource):
https://peerj.com/articles/16427/#supp-2

Kindly complete the review form and return with your decisions and recommendations.

The types affected 2006, 2018 and 20xx

Cowling et al provide a summary of changes between version in table 2 of the paper. **The types affected (using the NVM 2018 classification)**:

1. Overberg Dune Strandveld (FS7),
2. Blombos Strandveld (FS8),
3. Groot Brak Dune Strandveld (FS9),
4. Goukamma Dune Thicket (AT36) &
5. St Francis Dune Thicket (AT57).

Boundary edits (followed later by adjustments to the descriptions) will apply to:

- Overberg Dune Strandveld (FS7),
- Groot Brak Dune Strandveld (FS9),
- Goukamma Dune Thicket (AT36) &
- St Francis Dune Thicket (AT57).

Types proposed for deletion from the NVM classification system: Blombos Strandveld (FS8)

New types proposed:

- Southwestern Strandveld (proposed code FS10)
- Grootbos Strandveld (proposed code FS11)
- Southeastern Strandveld (proposed code FS12)
- Goukamma Strandveld (proposed code FS13)
- St Francis Strandveld (proposed code FS14)

Important considerations for reviewers

- Is to note the size of the unit Grootbos Strandveld at 3960ha (proposed code FS12). The ecology should be the primary driver of the inclusion of the unit. The NMDS in the paper and the description for the type indicate the plots surveyed in these communities as a distinct group and would support the proposal that the type should be added as its own unit. We

note that other units of a similar size or smaller currently exist in the NVM i.e. (Vhavenda Miombo (~62ha) and Robertson Granite Renosterveld (1923ha).

- Secondly the polygons in the paper replace only a portion of Blombos Strandveld. Only one polygon of this type remained after changes were implemented in 2018. In this paper the eastern and western extents are further reassigned to Southwestern Strandveld. Therefore less than 1024ha (less than 16% of its original extent and restricted to a small portion in the western most part of its original range). This remaining extent is indicated in the red circle. Furthermore the remaining extent of this type was queried and Dr Adriaan Grobler had the following response: Unfortunately, this left a small stretch of 'Blombos Dune Strandveld' between the Duiwenhoks and Bree Rivers (as well as tiny slivers elsewhere along the Cape south coast). At the time we decided to maintain the stretch of 'Blombos Dune Strandveld' as we were unsure of the floristic composition in that area, but I now believe that it should be treated as a mapping error and that all areas mapped as 'Blombos Dune Strandveld' should be mapped as 'Hartenbos Dune Thicket'; i.e., they are synonymous vegetation types (as you have highlighted, there is a lot of overlap between the two types in terms of species composition). So in short, I agree with you that the vegetation between Jongensfontein and Still Bay should be treated as 'Hartenbos Dune Thicket'.
  Blombos Strandveld is therefore recommended for deletion and for the area to be replaced by Hartenbos Dune Thicket

Conclusion

Strandveld types have long-been recognised as a group that needs refinement in the NVM. Changes were made-ad-hoc in 2018 as a result of the revision of the Thicket biome types but specific focus was needed to accurately correct the classification and mapping of strandveld. The paper published by Cowling et al 2023 addresses many of the issues through a detailed and thorough analysis of the vegetation types in question providing descriptions, justification for removing existing types and evidence supporting the introduction of new types.

References

1. Cowling RM, Cawthra H, Privett S, Grobler BA. 2023. The vegetation of Holocene coastal dunes of the Cape south coast, South Africa. PeerJ 11:e16427 http://doi.org/10.7717/peerj.16427
2. Mucina, L., Adams, J.B., Knevel, I.C., Rutherford, M.C., Powrie, L.W., Bolton, J.J., van der Merwe, J.H.J., Anderson, R.J., Bornman, T.G., le Roux, A. & Janssen, J.A.M. 2006. Coastal vegetation of South Africa. In: Mucina, L. & Rutherford, M.C. (eds), The vegetation of South Africa, Lesotho and Swaziland: 658-697. SANBI, Pretoria. (Mucina et al. 2006)
3. Rebelo, A.G., Boucher, C., Helme, N., Mucina, L., Rutherford, M.C., Smit, W.J., Powrie, L.W., Ellis, F., Lambrechts, J.J., Scott, L., Radloff, F.G.T., Johnson, S.D., Richardson, D.M., Ward, R.A., Procheş, S.M., Oliver, E.G.H., Manning, J.C., Jürgens, N., McDonald, D.J., Janssen, J.A.M., Walton, B.A., Le Roux, A., Skowno, A.L., Todd, S.W. & Hoare, D.B. 2006. Fynbos Biome. In: Mucina, L. & Rutherford, M.C. (eds), The vegetation of South Africa, Lesotho and Swaziland: 52-219. SANBI, Pretoria. (Rebelo et al. 2006)
4. Dayaram A, Harris LR, Grobler BA, Van der Merwe S, Rebelo AG, Powrie LW, Vlok JHJ, Desmet PG, Qabaqaba M, Hlahane KM, Skowno AL. 2019. Vegetation map of South Africa, Lesotho and Swaziland 2018: a description of changes since 2006. Bothalia. African Biodiversity & Conservation 49:111 DOI 10.4102/abc.v49i1.2452.

National Vegetation Map Proposed Edits Control Sheet

This control sheet is designed to help the VEGMAP Project team at SANBI keep a long term record of evidence submitted for edits to the National Vegetation Map. Kindly complete Sections A and B1. Please contact us if you need assistance when completing the form. See Appendix A for guidance on proposing edits, types of edits and accepted data required for a motivation. Any proposal for changes to the National Vegetation Map must be accompanied by this control sheet.

SECTION A: Description of edit

Vegetation type/types affected	1.Overberg Dune Strandveld (FS7), 2.Blombos Strandveld (FS8), 3. Groot Brak Dune Strandveld (FS9), 4.Goukamma Dune Thicket (AT36) & 5.St Francis Dune Thicket (AT57).
Type of Edit (tick)	☒Major ☒Minor ☐Other _____
Brief description: Strandveld types have long-been recognised as a group that needs refinement in the NVM. The paper published by Cowling et al 2023 addresses many of the issues through a detailed and thorough analysis of the vegetation types in question providing descriptions, justification for removing existing types and evidence supporting the introduction of new types. Boundary edits are proposed for FS7, FS9, AT36, and AT57. FS8 is recommended for deletion. And five new types are proposed: Southwestern Strandveld (proposed code FS10); Grootbos Strandveld (proposed code FS11); Southeastern Strandveld (proposed code FS12); Goukamma Strandveld (proposed code FS13); St Francis Strandveld (proposed code FS14).	

SECTION B: Description of review process

B1: To be completed by the Proposer:

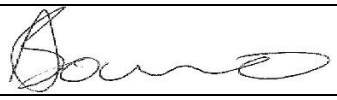
Name of person/s proposing edit	Anisha Dayaram on behalf of authors of The vegetation of Holocene coastal dunes of the Cape south coast, South Africa
Organisation and role	SANBI
Nature of evidence provided to justify change	☒ Site visits ☒ Desktop delineation ☐ Published technical report ☒ Peer Reviewed Article ☒ GIS spatial data
Change criteria cited in the motivation	☒ MN1 ☐ MN3 ☐ MN4 ☐ MN5 ☒ MJ1 ☒ MJ2 ☐ MJ3 ☐ MJ4
Signature of Lead Proposer: 	

B2: To be completed by the Reviewer/s

Name of 1st reviewer	Alastair J. Potts	
Organisation and role		
Member or associate of the NVM-TEM Committee	☒ Yes	☐ No
Does the proposal meet the criteria cited for the proposed change?	☒ Yes	☐ No
Approved for incorporation in a version of the National Vegetation Map?	☒ Yes Provisional acceptance, pending changes to proposal	☐ No
Recommendations for strengthening proposal: *To further improve the already impressive assessment, we can ask the authors to provide species lists of common communities of fynbos and thicket in the various vegetation types and zones within the vegetation types. This should be fairly straightforward as it should be an amalgamation of selected releve plots.*		

Signature of reviewer


B3: Approval NVM-TEMC Chair/Biome lead

Name of NVM-TEMC Chair/Biome Lead	AL Skowno	
The proposal is approved	☒ Yes	☐ No
Signature of NVM-TEMC Chair or biome lead		

Other recommendations from the NVMC:

1. AJP: The paper is very well written and very descriptive for NVM purposes, and I support the changes. As per our conversation on Tuesday, the authors should easily be able to provide species list for various zones within the vegetation types given they have the releve data, and we should ask them to consider providing this to further improve the vegmap product.
2. TR response and recommendation:
   I have no major issues. I agree with most of this. Especially the mapping of the types within the dune systems. [an exchange followed regarding the classification of types based on available data followed by the below response)
   If this is the case, I would prefer to see the communities listed under each type with their characteristic species, rather than just a single species list per type.
   As I have stated many times, a single species list is utterly useless: one does not see types in the field, one deals with communities. Types are a landscape unit of communities. When one is standing within a type, the species in communities outside the current focus are irrelevant, and provide no useful information in defining the type.

NVMC recommendation:

The NVMC has resolved to refine our descriptions of vegetation types described in the National Vegetation Map. A description of communities that form the building blocks of a proposed vegetation type needs to be presented as part of the justification for the proposal of a new type. To date the NVMC does not have a good example to share with the authors of this proposal. However the proposal is accepted but we will work with the authors (if they are willing) to help draft a first draft example of a description of communities for the new types proposed. AJP indicated that some communities may already be described in Tinley (1985). This will be explored together with new data from the authors.

APPENDIX: The process for submitting updates and revisions

*extracted from Section C of The National Vegetation Map Handbook: A guide for users and contributors

Table 1 Types of changes and proposal requirements

No	Types of change	Benefit	Issues	Requirements	Process
	Minor Change				
MN1	Boundary shifts (realignment)	Improved spatial accuracy	The scale of the affected boundary line, and resultant gains and losses of extent will result in changes to threat status and protection levels which will have to be recalculated.	• Motivation, • GIS shapefiles and data • Must be complete (not stop at cadastral boundaries)	A proposal must be submitted to SANBI via email. The decision will be reviewed internally by the SANBI VEGMAP team.
MN2	Creation of a sub type/community within an existing vegetation type	Improved accuracy of classification and spatial data	Inconsistency in the scale at which subtypes are accepted could influence the consistency in the classification.	• Motivation • GIS shapefiles and data or description of units (polygon #) • Publication in peer review/fine-scale biodiversity plan, Environmental Management Framework or Strategic Environmental Assessment	A proposal must be submitted to SANBI via email. The decision will be reviewed internally by the SANBI VEGMAP team.
MN3	Change in Vegetation type name (without spatial or description changes) *Special circumstances for this change are described in the Handbook	Correction in spelling or name better reflects the description of the Vegetation Type e.g. Rûens to Ruens	Small mismatches with previous versions of the NVM will arise when comparing database tables.	• The proposed new name and motivation must be submitted. • Must meet criteria for name changes. See Handbook.	A proposal must be submitted to SANBI via email. The decision will be reviewed internally by the SANBI VEGMAP team.
MN4	Change in vegetation type description e.g. list of endemic species	Improvement in more accurate description of a vegetation type and more accurate description of dominant species, endemics etc.	Implications minor or major. Descriptions could change again if boundary shifts later. Most updated names of species must be used. May conflict with text in book	Paper with plot data and environmental data supporting description or if change is just for change in species dominance plot data with species abundance.	A proposal must be submitted to SANBI via email. The decision will be reviewed and decided by the committee.
MN5	Boundary shifts when neighbouring country or coastal borders are redefined	Map remains updated to the latest country boundaries	New areas which may not previously have been included in the map may not have any data.	• Motivation, • GIS shapefiles and data	A proposal must be submitted to SANBI via email. The decision will be reviewed internally by the SANBI VEGMAP team.
MN6	The creation of new polygons of an existing vegetation type that may be disjunct from existing polygons of that type and beyond a reasonable* range extension or reduction. *to be determined by the NMVC on a case by case basis	Improved accuracy of classification and spatial data	Scale of boundary lines, gains and losses of extent, changes to threat status and protection levels, classification consistency	• Requires a strong motivation, • GIS geodatabase files or description of units (polygon #), • Publication in peer review/Formal technical report such as a fine-scale biodiversity plan	A proposal must be submitted to SANBI via email. The decision will be reviewed and decided by the committee.
	Major Change				

MJ1	Removal of a Vegetation type from the classification system or downgrading a type to a level below a vegetation type e.g. subtypes.	Removal of spurious types. The polygons of the removed type will be dissolved into remaining types.	Usually associated with boundary shifts (see above) and affects classification consistency	• Requires a strong motivation, • GIS geodatabase files or description of units (polygon #), • Publication in peer reviewed journal	A proposal must be submitted to SANBI via email. The decision will be reviewed and decided by the committee.
MJ2	Create new vegetation type (replace existing) or upgrading of a subtype to a Type.	Improved accuracy of classification and spatial data	Scale of boundary lines, gains and losses of extent, changes to threat status and protection levels, classification consistency,	• Requires a strong motivation, • GIS geodatabase files or description of units (polygon #), • Publication in peer reviewed journal	A proposal must be submitted to SANBI via email. The decision will be reviewed and decided by the committee.
MJ3	Reassignment of a community in a vegetation type from an existing vegetation type to another existing vegetation type	Improved accuracy of classification	Usually associated with boundary shift (see issues above), classification consistency	• Motivation • GIS shapefiles and data or description of units (polygon #) • Publication in peer reviewed journal • Fine-scale biodiversity plans, Environmental Management Framework or Strategic Environmental Assessments can be submitted	A proposal must be submitted to SANBI via email. The decision will be reviewed internally by the SANBI VEGMAP team. Only peer reviewed literature will be accepted.

Table 2 Important issues that must guide revisions

Issues	Description	Proposed Solution
Stability vs. Improvement	The update process must allow for legitimate improvements while maintaining a stable vegetation map.	Major revisions will be released so that they are aligned with the NEM:BA listing of threatened ecosystems, while smaller changes (updates) will be allowed between listing events.
Defensibility	Scientific basis for change must be maintained;	Minor Changes: Should be supported by peer reviewed literature or official reports such as biodiversity plans, EMFs, SEAs PhD, MSc or government reports. Major Changes: Only peer reviewed literature will be accepted.
Maintain consistency	Maintaining consistency in classification hierarchy and spatial scale used within each biome. These may differ significantly.	The Committee and the VEGMAP Team needs to keep in mind the scale and classification “depth” for each biome
Alignment with other Realms	Ecosystem classification and mapping is a major focus of the NBA and as a result there will be an opportunity to discuss the integration of vegetation map with the estuary map, coastal and marine habitat map and wetland map. Alignment with catchment boundaries will also be advantageous where possible.	The National Ecosystem Classification Committee will develop a joint approach to integration of ecosystem type maps across all realms. The scale of mapping will guide the process in some instances.
Spurious changes	Systems need to be established to avoid, ad hoc updates and changes that could be considered politically or commercially motivated.	The NVMC will decide on all changes to the map apart from purely technical corrections. Submissions that meet the requirements but are deemed to be spuriously motivated will not be accepted.
Precedents set in previous versions / updates	The original veg map was a ground-breaking product, multi-author product which inherited a few inconsistencies. The updates and revisions should aim to reduce these inconsistencies, not perpetuate them.	The VEGMAP Team at SANBI in conjunction with the National Vegetation Map Committee needs to take cognisance of the existing inconsistencies and propose potential solutions for future updates.