

National Biodiversity Assessment 2018

TECHNICAL REPORT

Volume 5:

Coast

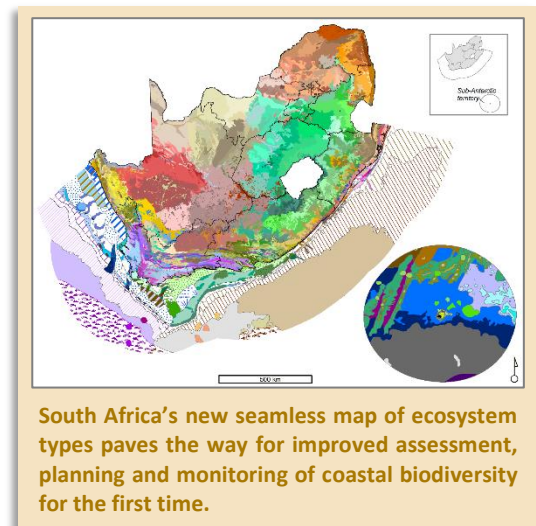


EXECUTIVE SUMMARY

Overview of NBA 2018 Coast

The National Biodiversity Assessment (NBA) is a collaborative effort to synthesise and present the best available science on South Africa’s biodiversity, with the intent of informing policy, planning and decision making in a range of sectors, particularly those that rely on and/or impact biodiversity, e.g., fisheries, water, mining, tourism, transport and human settlements. Information presented in the NBA can help to prioritise efforts and resources for managing and conserving biodiversity towards sustainable development in South Africa. The NBA describes the benefits of and key pressures on biodiversity and, where possible, identifies trends. Most importantly, it reports on two headline indicators – ecosystem threat status and ecosystem protection level – that provide a high-level summary of the current state of biodiversity within South Africa, and that can be included in other national and international monitoring and reporting processes.

In the past two NBAs, these indicators have been assessed independently for the terrestrial, inland aquatic, estuarine and marine realms. The most significant advance for South Africa’s coast in NBA 2018 was to align the national terrestrial, estuarine and marine maps of ecosystem types. This resulted in a seamless, cross-realm map that includes structurally and functionally appropriate ecosystem types at the land-sea interface for the first time, delineated at a fine scale. From this point, an ecologically determined coastal zone was identified that comprises the coastal terrestrial and marine ecosystem types, and all estuarine ecosystem types. Inland aquatic features are not included at this time. Thus, in NBA 2018, the headline indicators are presented for South Africa’s coast as a cross-realm zone. No separate analyses were undertaken for the coast; these came from the realm assessments; although, as far as possible, cross-realm considerations were included when evaluating the coastal ecosystem types. It was initially anticipated that this report would thus be a short simple “repackaging” of results from the constituent realms for those ecosystem types that comprise the coastal zone. However, it soon became apparent that there are many cross-realm stories, ecological processes, pressures and priorities that have slipped between the cracks of the traditionally independent assessments and technical reports, which have now been identified and raised here. Given the timing of the decision to write a separate coastal technical report in the NBA 2018 timeline, it includes only results of the ecosystem assessments, and does not include species information; however, it is recognised that coastal species information will be important to include in the next iteration. There are 16 key findings from the assessment of South Africa’s coastal biodiversity, from which 10 priority actions are identified, and 19 knowledge gaps—research priority clusters are compiled under four themes: these are all listed at the end of this Executive Summary.



The South African coast is a national asset, rich in biodiversity, history and cultures that are all woven into the fabric of our national heritage. Despite comprising only 4% of the mainland extent, the ecologically determined coastal zone (as defined in the NBA 2018) includes nearly a fifth (19%, 186) of its 987 ecosystem types: our coast truly has exceptional biodiversity, with many endemic species, particularly along the national south coast. This is largely a result of the strongly contrasting conditions around the coast, driven by the warm Agulhas Current sweeping down the east coast, and cool Benguela Current up the west coast, with

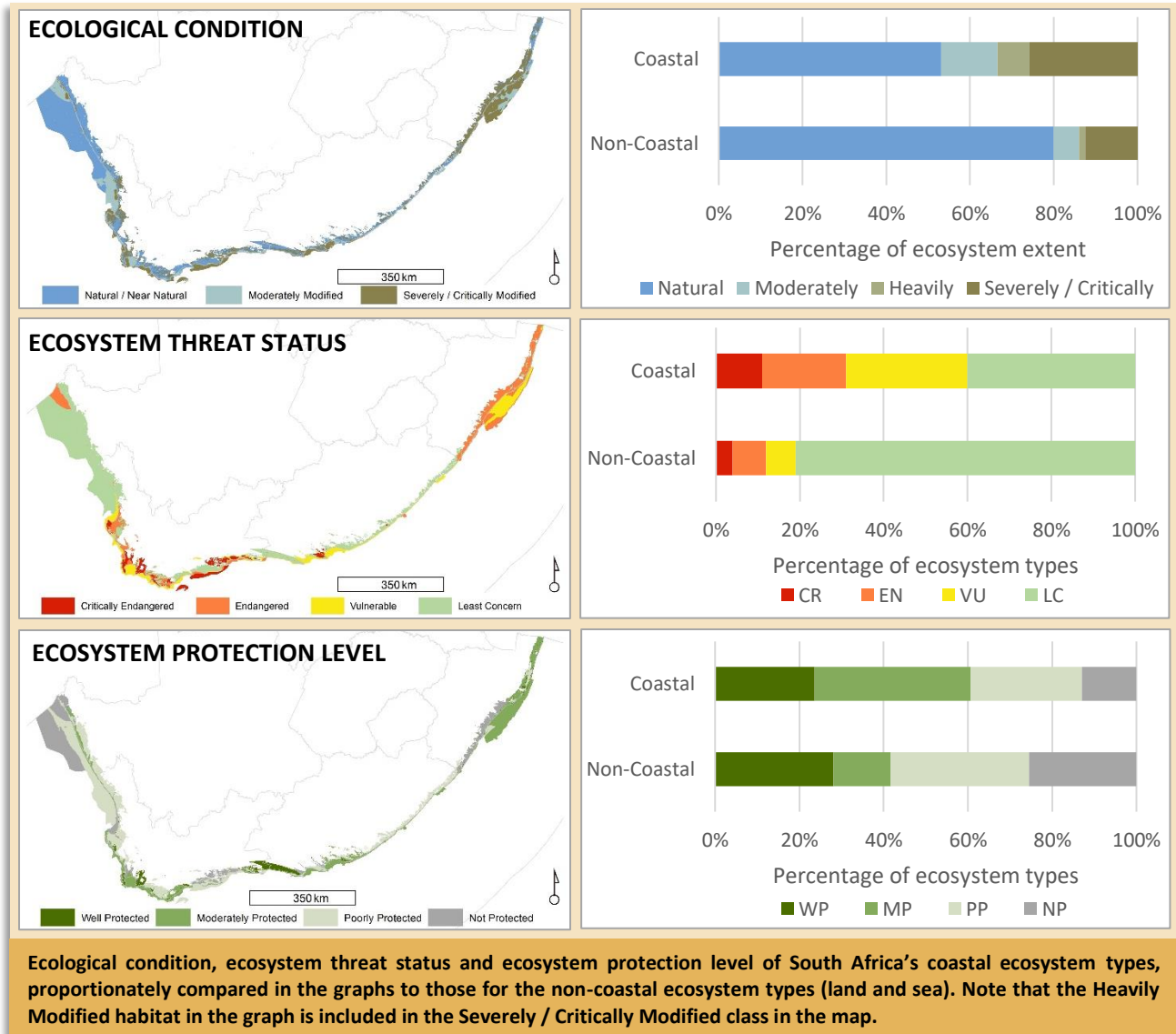
distinct patterns in temperature, rainfall and geology that create the physical underpinning of our biological diversity. The coast also provides a wealth of benefits to the economy, society, and human health and wellbeing that sustain and enrich the lives of many South Africans. These include both tangible and intangible benefits, including: provision of food, medicine and useful materials; disaster-risk reduction, coastal protection, and other unseen services like water filtration, nutrient cycling and carbon sequestration; key assets for tourism; job opportunities; places that support health, wellbeing, social cohesion, sports events, cultural and spiritual practices; and opportunities for learning and connecting with nature. The coast is a relatively small area, but comprises a treasure trove of biodiversity and benefits for all South Africans to enjoy. It is no wonder that visiting our beaches is one of the most popular tourism experiences by both local and international visitors.

However, coasts are also at the interface between land and sea, and thus face diverse pressures from both the landward and seaward sides. In fact, coastal ecosystems in South Africa are under more cumulative pressure than the non-coastal areas of our mainland territory, with terrestrial habitat loss in the coastal zone occurring at twice the rate than that across the rest of the country. Ports and harbours are key drivers of cumulative coastal impacts and ecological degradation by providing points of access to the sea, leading to burgeoning development, changing local shoreline orientation, and being pressure hotspots. The most intensive pressures in our coastal zone are biological resource use, coastal development and mining. Further, many of the coastal species targeted by recreational and small-scale fishers are assessed in the estuarine and marine technical reports as overexploited or collapsed and/or threatened, with open access and poaching playing a key role in stock or threat status. Several forms of pollution are also impacting coastal biodiversity but many are understudied and poorly understood and/or are not well mapped, precluding use in the NBA 2018, including: chemicals (from heavy metals to pharmaceuticals; note, though, that wastewater discharge is included in the assessment), plastics and microplastics, light and noise pollution. Notwithstanding, deteriorating water quality is a key issue in the coastal zone, particularly in retentive systems like estuaries and bays.

A third of South Africa's freshwater flow no longer reaches the coast, with 20% of estuaries under high or very high flow modification. This freshwater flow reduction impacts estuarine and coastal marine ecosystems as far offshore as the shelf edge in some places, with knock-on effects for coastal tourism, human health, and food and job security. Further, sand delivery to the coast through rivers and estuaries, and movement of sand across land in mobile dunefields and in the surf and inner shelf has not been well managed since the mid-1800s, with the net and overlooked result that many beaches are sand-starved and in a state of erosion. Invasive species in the terrestrial portion of the coast are an established threat to biodiversity largely from deliberate introductions to stabilize dunes, but are an emerging threat to estuarine and coastal marine biodiversity from unintended introductions, mostly reported from ports and harbours that serve as both entry points and refugia for these alien species. Both invasive species and climate change are exacerbating pressures to coastal biodiversity by changing natural ecological processes and reducing resilience of indigenous species. Some of the most important climate-change impacts for coastal systems are sea-level rise, increases in the frequency and intensity of extreme storms, and temperature change driving shifts in species distributions. The former two are most important in urban areas where there is coastal development inappropriately close to the shore, where risks to human safety, biodiversity and infrastructure are most high.

As a result of the high level and diversity of pressures to coastal biodiversity, 60% (112 of 186) of our coastal ecosystem types are threatened, comprising 55% of the coastal extent, compared to 85 (19%) threatened ecosystem types that comprise 6% of the rest of the country (non-coastal land and sea). Proportionately, this means the coast has three times the number of threatened ecosystem types and an order of magnitude more threatened area than the rest of the South African mainland territory. However, the recent expansion of the

terrestrial and marine protected area estate has led to excellent progress in representing coastal ecosystem types in protected areas, with 87% of coastal ecosystem types now having some level of protection. However, only a quarter (24%) are Well Protected, covering just 9% of the coastal extent, meaning 76% of ecosystem types covering 91% of the coast are not yet meeting their biodiversity targets for protection. Of the 112 (of 186) threatened coastal ecosystem types, 102 (91%) are under-protected. Thirteen of these are high risk, because they are highly threatened (Critically Endangered or Endangered) and Not Protected. There are two hotspots of high-risk ecosystem types that should be prioritised in protected area expansion strategies: around the Orange River mouth and around Durban.



Given that this is the first time a dedicated coast technical report has been compiled, reflection on the assessment of the ecological condition, threat status and protection level of the coast indicates that the current approach has limited accuracy for seashore ecosystem types (shores and seashore vegetation). The small, largely linear extent of these ecosystem types requires data and assessment at a higher resolution than for the rest of the terrestrial and marine realms, and needs better incorporation of cross-realm connections in the next NBA. As is a hallmark of South Africa's biodiversity planning and assessment over the last few decades, each iteration of a product works with the best available science, identifies knowledge gaps and areas for further refinement, with each subsequent iteration improving in resolution and accuracy. Nineteen knowledge gaps have been identified in this report as research priorities to strengthen further coastal biodiversity foundational knowledge and understanding of impacts to coastal biodiversity to improve

assessment, and also to better understand the benefits of biodiversity and the best ways of communicating the these in a way that most inspires South African's into action for change towards long-term sustainability.

Restoring, managing and conserving coastal biodiversity in South Africa is a key step towards sustainable development, securing jobs and livelihoods, alleviating poverty, and enhancing our health and wellbeing. Many of the priority actions emanating from this report relate to restoring our coast, which aligns well with the recently announced United Nations Decade on Ecosystem Restoration 2021-2030. Now more than ever, South Africa is poised to secure key coastal biodiversity and ecological infrastructure: there are still substantial proportions of the coast in natural / near-natural ecological condition, and the integrated map of ecosystem types and findings, priority actions and research priorities from this report pave the way for better biodiversity planning, management and decision-making in the coastal zone. In particular, the integrated map of ecosystem types and definition of the ecologically determined coastal zone has facilitated production of the first iteration of the National Coastal and Marine Spatial Biodiversity Plan (Critical Biodiversity Area Map (CBA Map) and associated land- and sea-use guidelines) that aligns and is seamlessly integrated with the terrestrial CBA Maps. Further, it is designed explicitly to capture cross-realm coastal processes and connections and strengthen biodiversity prioritisation for the coast as an ecological entity in its own right rather than having independent systematic biodiversity planning above and below the high-water mark, with current work underway to further improve this cross-realm spatial plan. The National Coastal and Marine CBA Map is thus proposed to be the key tool by which to align governance, planning and decision-making across realms and across organs of state to achieve effective, science-based and proactive integrated coastal zone management.

“Ultimately, just because it is a narrow, linear system at the land-sea interface, the coast (and especially the seashore) should not be considered a messy edge between terrestrial, estuarine and marine plans that needs to be aligned; it is a space that requires deliberate, integrated planning as a coherent unit... Given the significant value of the coast and its acute vulnerability at the land-sea interface, especially in the face of accelerating global change, we can no longer afford to split the system into convenient compartments. The key to coastal resilience is in maintaining the ecological connections across the land-sea interface that define and support functioning of this ecotone...” (Harris et al. 2019a)

Summarised Key Findings

1. The new integrated map of ecosystem types will improve coastal assessment and planning
2. There is rich biodiversity and high endemism in the coastal zone
3. There are abundant benefits from coastal biodiversity
4. Coasts are hotspots of cumulative pressure, which drives poor ecological condition
5. Ports and harbours are drivers of cumulative impacts and ecological degradation
6. Key intensive coastal pressures are biological resource use, coastal development, mining
7. Accessible coastal species are often overexploited or threatened by overfishing
8. Substantial flow modification in estuaries is impacting many coastal ecosystem types
9. Sand supplies to beaches and dunes are severely reduced and long overlooked
10. Invasive species and climate change are exacerbating pressures to coastal biodiversity
11. Many pollution pressures are poorly understood and mapped, limiting their inclusion
12. 60% of coastal ecosystem types are threatened, comprising 55% of the coastal extent
13. 24% of coastal ecosystem types are Well Protected, comprising 9% of the coastal extent
14. Biodiversity in 13 ecosystem types is at high risk of being lost
15. Assessment of the seashore needs improvement in resolution and cross-realm connections
16. South Africa is poised to secure coastal biodiversity and benefits

Top 10 Priority Actions for Managing and Conserving Coastal Biodiversity



1. Restore the coast

Restore and maintain coastal ecological infrastructure as part of a national coastal restoration plan to strengthen climate resilience and sustain ecosystem services and key benefits to South Africans.

2. Diversify and create more jobs

Diversify and create more job opportunities for coastal communities from tourism and coastal restoration and monitoring programmes to supplement their livelihoods.



3. Ensure sufficient quantity and improve the quality of freshwater flows to the coast

Ensure sufficient freshwater flows through estuaries to the coastal and offshore marine environments, and improve coastal water quality by addressing pollution, particularly in priority areas, all to maintain healthy biodiversity assets and associated benefits.

4. Re-establish flows of sand to beaches and dunes

Re-establish natural sand supplies to the coast, where possible, to replenish sand-starved beaches and dunes and thereby maintain benefits of coastal protection, sustain South Africa's most important biodiversity asset for tourism, and safeguard our unique beach biodiversity.



5. Improve management to rebuild depleted stocks of overfished coastal species

Improve management of recreational fishing and ensure that the emerging small-scale fishery is effectively managed for long-term sustainability.



6. Reduce mining impacts

Reduce the impacts of mining by stopping illegal mining, avoiding biodiversity priority areas, and improving rehabilitation.

7. Locate ports and harbours carefully

Locate new ports and harbours appropriately through careful cross-sectoral planning to avoid widespread degradation of biodiversity priority areas and related benefits from the cumulative impacts associated with better ocean access.



8. Use the new Coastal and Marine Spatial Biodiversity Plan to 'close the gaps'

Use the new Coastal and Marine Spatial Biodiversity Plan (CBA Map and associated land- and sea-use guidelines) to align governance, planning and decision-making across realms and organs of state to achieve proactive, science-based integrated coastal zone management.

9. Effectively communicate the benefits of coastal biodiversity

Effectively communicate the value of South Africa's coastal biodiversity through improved coordinated messaging that articulates benefits to build support for coastal conservation and mobilise people to sustainably use coastal biodiversity.



10. Address knowledge gaps

Catalyse research to address critical knowledge gaps that limit the assessment of coastal biodiversity and decision making for sustainable use and safeguarding the benefits of coastal biodiversity assets, especially in the face of global change.

Knowledge Gaps and Research Priorities

There are 19 knowledge gap–research priority clusters emanating from this report listed below under four themes:

Foundational data and knowledge

1. Advance the map of coastal ecosystem types
2. Improve taxonomic knowledge; map and assess coastal species
3. Address realm-specific foundational knowledge gaps to strengthen the coastal assessment

Pressures, pressure impacts and monitoring

4. Map pressures and assess ecological condition at appropriate scales
5. Map additional terrestrial pressures to include degradation as part of assessing ecological condition
6. Determine freshwater- and sediment-flow requirements for coastal and marine systems
7. Collect long-term data to improve models of climate change, and track impacts to coastal biodiversity
8. Map and better understand the impact of emerging pressures on coastal biodiversity
9. Improve understanding of ecosystem degradation and links between pressures and impacts
10. Refine thresholds for classifying ecological condition from habitat degradation
11. Invest in strategic long-term coastal biodiversity monitoring programmes

Assessment

12. Improve application of the IUCN Red List of Ecosystems criteria by testing scale and thresholds and creating models of ecosystem collapse
13. Investigate the effectiveness of protected areas in conserving biodiversity as a second indicator for ecosystem protection level
14. Increase Red Listing of species, especially invertebrate and cross-realm species
15. Update and increase the number of fisheries stock status assessments
16. Assess the protection level of coastal species
17. Map and assess the status of coastal ecological infrastructure

Benefits and messaging

18. Collect data and knowledge on the benefits of coastal biodiversity
19. Identify strategies of communicating the benefits of biodiversity that most inspire action for change



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“The ribbon of land and sea we call the coastal zone is one of substantial natural complexity and may well harbour the most complex make-up and interplay of environmental systems on Earth. In the entire Solar System, Earth’s coastal zone is unique and therefore should be afforded special attention and care.” Rust (1991)