Natural Science Collections Facility

SOUTH AFRICA

Annual Report to the

Department of Science, Technology & Innovation

1 April 2024 to 31 March 2025

science, technology & innovation

Department:
Science, Technology and Innovation
REPUBLIC OF SOUTH AFRICA

SANBI
Biodiversity for Life
South African National Biodiversity Institute

Contents

1. Rationale and Scope

- Research collections are essential for all countries with scientific enterprises, and they should be considered as large scale, global research infrastructure. South Africa has an estimated 20 million objects or specimens representing over 100,000 different species in natural science collections.

- Natural science collections and the data associated with these are a crucial resource for a wide range of society both nationally and globally, including researchers, environmental assessment consultants, land use managers and planners, farmers, bio prospectors, students, learners and decision-makers.

- South Africa's natural science collections are managed in a highly fragmented and largely isolated environment and there is no common strategy or approach to research which means that their full potential as a national research infrastructure is not being realised. In addition, the specimen data are largely inaccessible, which causes delays in decision-making or poor decision-making relating to sustainable development and sustainable harvesting of natural resources, both of which have considerable economic impacts. Inaccessible data also limits their use in large scale, multi- and trans-disciplinary studies.

- The NSCF aims to address this situation, which will have positive impacts on research in numerous fields, on the economy through providing critical information for agriculture, fisheries, pest control, alien invasive management, natural products, and on society which benefits from biodiversity in virtually all aspects of life.

- The NSCF is a distributed network of institutions that hold natural science collections, with a Central Co-ordinating Hub hosted at SANBI in Pretoria. There are currently 18 institutions participating in the NSCF, including three national and five provincial museums, one municipal museum, four science councils, four universities and one citizen science organisation. SANBI is responsible for the overall implementation of the project plan and management of the budget allocation for the NSCF from the DSTI. The individual institutions continue to be supported by their existing structures, and continue to report to these but will collaborate to meet the objectives of the NSCF, and will receive support in order to enable this.

Expected deliverables, outputs, outcomes and impacts

Deliverables specified in the Agreement between the Department of Science, Technology & Innovation and SANBI for the NSCF from 2024/25 to 2028/29.

Deliverables	Outputs	Outcomes	Impact
Publication of methods and approaches used in 2023 collections assessment	Papers published in peer reviewed journal	Sharing of knowledge and tools developed by NSCF internationally	Recognition of NSCF and South Africa for innovation in collection assessment
Three to six orphan and at risk collections transferred to secure environments according to the NSCF guidelines	Well managed, secured and accessible collections of biological specimens; secured for long term use.	Increased research and education outputs in a range of fields, by national and international scientists currently and into the future.	Increased knowledge of South Africa's past and present biodiversity for the benefit of all of society, including future generations; International recognition for SA collections
Online tracking tool for status of collection management and curation - ongoing updates by collection institutions according to progress on meeting standards set in NSCF Manual	Information available for collection management and curation activities and targets in annual and three-year plans of institutions and individual workplans. NSCF Hub staff able to identify problem areas for interventions (training, investment or other forms of support).	Efficient allocation of resources to address priorities. Increased accountability.	
Virtual museum includes type specimen images (>3000 specimens); herbarium specimen images (>1.5 million); specimen data sets (15 collections); and archival documents (1000) for plant, animal, fungi and fossil groups	Integrated and openly accessible images of specimens and digitised archival documents used by researchers, postgraduate students, undergraduates and learners nationally and globally.	Increased research and education outputs in a range of fields. Reduced impact of use on specimens and documents which results in longer term preservation.	

Review of status of collection data sets (extent, quality and completeness; extent of publication on GBIF) **Tracking tool for status of specimen data**: extent of digitization, verification, upgrading and publication on GBIF	Information available for data management and digitisation activities and targets in annual, three-year and individual workplans. Informed decisions for NSCF plans.	Increase in extent and quality of data available for research and decision-making. More efficient use of resources by institutions and NSCF to address priorities.	Improved quality of biodiversity assessments and decision-making to mitigate development impact on biodiversity; sustainable development. Increased knowledge generation in a wide range of fields including biodiversity conservation, climate change and mitigation; and improved conservation assessments
Expansion of collection data sets: data for a minimum of 300 000 specimens captured **Publication of at least 15 new collection data sets on GBIF**	Specimen data accessible globally for research, decision-making.	Increased use of collection data for research and decision-making.	
At least 3 Communities of Practice established for collection management and curation; data management, with regular sessions focused on specific topics identified in the collections assessment **Attendance by staff at a minimum of 6 courses in collection management / curation and data management** **Participation in a minimum of 6 international conferences and workshops** on natural science collections and data **Three NSCF Forums** to bring all collection staff together to share knowledge and experience	Collection based staff, including interns and postgraduate students upskilled. NSCF network strengthened.	Upskilled and qualified collections-based staff; greater effectiveness and efficiency in curation and management of collections. Sustainable network developed with increased collaboration and sharing of knowledge and resources.	Improved capability of institutions. Secured collections used globally by scientists to address critical issues related to biodiversity.

Organisational development and transformation sessions run with a minimum of 6 institutions; and with the NSCF Hub team	Institutional plans for collection management and curation, data management and research. Improved team coherence and effectiveness within institutions and the NSCF Hub.	Improved standard of collection management and curation; data management. Improved efficiency and productivity; use of scarce resources.	Collection management and curation, data management, research improved in institutions in both short and long-term
Emerging leaders development: at least 6 sessions run	At least 30 young staff working in collections as researchers, curators or technicians developed to play leadership role.	Improved succession in institutions. Improved productivity of staff in institutions. Youth empowerment.	
Report and publication on the impact of collection-related research and data in terms of the value chain	At least 1 paper published. Identification of mechanisms to improve knowledge and data flows.	Improved understanding of the value of collections and associated data. Increased accessibility of knowledge and data from collection-based research.	Improved evidence-based conservation and sustainable use of biodiversity
NSCF website provides materials promoting the value of natural science collections	Video showing collections, iconic specimens. Downloadable showcase documents explaining value of natural science collections.	Improved public understanding of biodiversity, its importance for human well-being and for national and cultural identity.	Biodiversity and collections viewed as national assets and treasures of value for science and decision-making; social cohesion; increased interest in life sciences by learners

2. Aim and objectives

The overall aim of the NSCF is to enable sustainable, enriched life on Earth by working as a dynamic network that values the African context, **to promote, upgrade and make accessible natural science collections and data for research and services.**

In order to realise this aim, the NSCF has the following overall goals:

NSCF goals, progress and future plans

1. Estimated 18-20 million **preserved plant, animal, fungi and fossil specimens** collected over the last 200 years, **well curated, and accessible either virtually or physically to the global research community for research** in biological, environmental and palaeosciences, for contributing to documenting past and present biodiversity, understanding global change impacts on species and biological communities, and possible mitigation and adaptation mechanisms.

2024/25 – 2028/29

- The methodology and approach for the collection assessment are novel and could be used internationally by other research collections or network initiatives (there is currently no standard system for assessing management and curation status). This will be published in appropriate international journal/s.
- The assessments have revealed some collections that remain at significant risk of deterioration and loss. There are a number of factors that are responsible for this situation and in some cases the collections or at least the most significant specimens should be moved to more secure institutions. This will require negotiation and support for packing and moving the collections and their accessioning at the receiving institution. Guidelines for decision-making for moving orphaned collections are required, including resourcing of recipient institutions and legal considerations.
- Support will be provided to institutions for addressing gaps in documentation (policies, procedures, workflows and standards) and for some of the curation processes. This support will be in the form of a number of Communities of Practice, co-ordinated and facilitated by the NSCF Hub together with staff from partner institutions.
- Interventions in the form of guidance and support for aligning plans with the gaps identified are planned, with the assistance of organisational development and transformation facilitators.

2. The data from the specimens (what it is, where it was collected, when it was collected as a basic minimum) assembled into **databases that are openly accessible in an integrated way for researchers, practitioners involved in monitoring and assessing the status of biodiversity (eg. threatened species assessments, alien invasive species risk assessments, environmental impact assessments for various forms of land use change and development), and decision-makers involved in authorisations for land use change (eg. mining, agriculture), development, and harvesting quotas (eg. medicinal plants, fish).** The data are currently incomplete (only an estimated 50% of specimens have label data captured in databases), with a large number of specimens for which data have not been captured (estimated 6 million, mostly insects) and gaps in the data for which there are digital records.

2024/25-2028/29

- We have realised that the process of transcribing/ digitising specimen data using an NSCF appointed team of data technicians was inefficient in relation to the extent of the work and the salary costs. Over the next year the **use of automated technologies and machine learning will be investigated** in collaboration with international teams and if feasible, implemented to increase specimen data sets over the subsequent five years.

- A **detailed analysis of the status of existing specimen data sets, the publication of these and use of published data** will be carried out to inform data mobilisation and publishing activities, as well as the development of a progress tracking tool.
- More **targeted and strategic data mobilisation and publishing activities** will be carried out depending on user needs (e.g. species threat assessments and data for the Department of Fisheries, Forestry and Environment's screening tool, projects on food and medicinal plants).

3. **Establishment of a Virtual Museum that provides online access to images of specimens from the collections of all participating institutions, specimen data sets and archival documents** such as field notes of historic collectors. Researchers, postgraduate students, EIA practitioners, threatened species and alien invasive species assessors, conservation authorities, and learners will be able to access the Virtual Museum for a range of projects.

2024/25 – 2028/29:

- The Living Atlas software which is open source will be used to set up the platform.
- Specimen data sets, specimen images and digitised documents will be uploaded and made accessible on an ongoing basis.
- Herbarium specimen imaging will continue and completion of all of the medium sized and smaller herbaria is expected by the end of 2026.
- SANBI is working with a conveyor belt system for imaging of the two largest herbaria (National and Compton Herbaria) and they are also expected to complete the work by the end of 2026. This system will then be moved to herbaria in other African countries.
- All newly collected specimens will be imaged on a regular or ongoing basis depending on the availability of equipment.
- Imaging of Karoo fossil and vertebrate (mammal, bird, reptile, amphibian and fish) type specimens will continue and it is expected that this will be completed by the end of 2026.
- Technologies for mass digitisation of millions of insect specimens need to be explored and potentially implemented from 2026/27.
- Digitisation of historical accession registers / catalogue books, field notes and research notes related to collections will continue and priority documents will be completed by the end of 2028.

4. Research outputs and translational research: understanding the use, impact and value of natural science collections

2024/25 – 2028/29

- Over the next three years we intend **investigating how the taxonomic outputs are used by other researchers and for informing policy and decision-making and how knowledge flows along the value chain**. This is essential to promote an understanding of the value of the collections as well as for addressing any breaks or blockages in the chain. Partnerships with institutions or units that have experience in bibliometrics and scientometric analyses will be necessary for this research. We will also analyse the use of collection data sets for South African biodiversity accessed on GBIF.
- The report and publications from the analyses will include **recommendations for increasing access, uptake and use of publications and data for enhancing impacts and benefits to society** and these will be implemented in from 2027.
- The NSCF Hub will continue to co-ordinate **the use and outputs from the collections and data** and will need to develop mechanisms to track use of the Virtual Museum resources.
- **Data and specimen identification services will be provided to requesters** on an ongoing basis. This includes provision of data for conservation and threat assessments for species, for the DFFE Screening Tool for land use decision-making, and for environmental impact assessments. Identification of biological material is carried out for a wide range of clients. These services are generally demand driven rather than being initiated by the collections community.

5. **Outreach and communicating the value of natural science collections**

The natural science collections are generally inaccessible to the general public, and few people, including decision-makers are aware of their existence or extent or value. The collections are often perceived as colonial relicts or as curiosities rather than as critical research infrastructure and a tangible, irreplaceable reference for the country's biodiversity.

2024/25-2028/29

- Over the next six years communication and outreach activities will be more targeted and strategic to **promote understanding of the value of collections to society**. The information presented will be audience specific, relevant to the African context, promote indigenous knowledge systems and contribute to public understanding of science and social cohesion. The outcome of this goal will have relevance beyond South Africa because many countries face similar challenges related to the lack of awareness of the value of the collections posing a threat to the sustainability of natural science collections.

- Some of the specific activities and outputs include the development of videos of collections and specimens of scientific or cultural significance for distribution on the Virtual Museum and other appropriate platforms, compilation of recommendations for museum displays on the collections and biodiversity to increase relevance to the African context and increasing public engagement in this topic.

6. **African and international engagement**

The value of international engagement through attending and presenting at conferences and workshops and participation in international bodies has become evident over the last few years, even though this has been predominantly virtual / online. We will increase international engagement through participation in the Society for the Preservation of Natural History Collections, Taxonomic Data Working Group, and iDigBio conferences and workshops, participation in the Specify Consortium Board of Directors and scientific and technical advisory boards.

We have not previously engaged with natural science collection institutions in other African countries. This was largely because the focus over the last six years has been on establishing the NSCF structures and having tangible products and skills that can be shared and have a meaningful impact. Curation and research staff at natural science museums in other African countries will be contacted to consider opportunities for knowledge sharing and collaboration. The possibility of an online African natural science collections symposium, participation in various NSCF online activities such as the collection management and curation course, and the Communities of Practice will be explored.

In order to achieve these objectives the following enabling strategies will be critical:

Strategy 1. Staffing and capacity development

- The NSCF has run training in the use of Specify software for managing collections and data, and a higher level mentorship programme for staff. The NSCF sponsored 17 staff to attend a customised Data Management course presented by the University of Pretoria. Various other workshops related to data management and use have been run by the NSCF or participation in workshops organised elsewhere has been supported. This type of work will continue.
- The NSCF collection management and curation course material will be reviewed and refined and be available online for independent study. More focussed shorter courses will be offered or participation supported over the next six years.

- The Community of Practice approach will be used for increasing capacity for collection and data management and curation. The NSCF will facilitate the establishment of these sessions.
- Emerging leaders from the participating institutions have been identified and a range of activities will be run to support the development of this component of the collections community.
- The NSCF Hub team includes 17 staff, 16 of who are on short term contracts. Ensuring team cohesion, staff well being and ongoing development is critical for the successful implementation of the NSCF.

Strategy 2: Transformation and organisational strengthening to enable the long-term sustainability of the collections and associated research to benefit society

The initial aim of the transformation process was to build a sustainable and functional NSCF network, with full participation and collaboration across institutions, recognising the African and South African context.

We have run a facilitated transformation and organisational strengthening process over the last six years. There was considerable focus on institutional leadership and this has had mixed impacts which is not unexpected given the diversity of governance structures, cultures, size and staff complements. The challenges that need to be addressed are complex and so the transformation and organisational strengthening work will continue but with a more targeted approach.

The collections assessment that was carried out in 2023 was designed as a transformative change process that included strengthening the NSCF network, information sharing, capacity development through engagement with the content of the NSCF Collections Management & Curation Manual and organisational development. Through the assessment process, the reports and regional sense-making workshops, some of the underlying factors that contribute to institutional challenges or achievements have become evident.

- The focus of the transformation and organisational strengthening process for the next five years will be on supporting selected institutions with specific challenges that were identified during the collections assessment process, and supporting institutions with planning and implementation for collection management and curation.
- Communication across the institutions includes regular use of a WhatsApp group and a Facebook page, which will both continue.
- The NSCF Forum will be held every 18 months but this is likely to be a virtual event to reduce the costs.

Strategy 3: Contributing to the identification of strategies and models that will ensure financial sustainability of the natural science collections.

As allocations from government and higher education institutions continue to decline, pressure to increase efficiencies is increasing. There are limited opportunities for commercial activities associated with the collections, but sharing knowledge and resources across institutions, and potentially rationalising some collections will be continuously investigated over the next six years.

3. Progress: 1 April 2024 to 31 March 2025

Strategic Objective	2024/25 Deliverables	Progress 1 April 2024 to 31 March 2025
1. Securing Collections	- Review of overall collections assessment report to identify main interventions required	Achieved Document with gaps and recommendations for each institution compiled, appropriate interventions drafted and Organisational Development facilitators have initiated engagements with institutions to address gaps identified from the collections assessments.
	- Develop guidelines for decision-making on transfer of orphaned/at-risk collections	Achieved Guidelines document developed.
	- Establishment of Communities of Practice to support institutions with addressing gaps in documentation and share best practice in collection management and curation	Achieved Four community of practice sessions held from October 2024 - December 2024. Restructured Communities of Practice pilot launched at 2025 NSCF Forum, where 10 minor sessions were hosted in three rounds. Pilot to be carried out over six month period spanning May 2025 - October 2025.
	- Publication in international journal on methods for collection assessment	Delayed, in progress Draft paper on collections assessment results produced and submitted to scientific journal. Paper on collections assessment methods planned.
	- Transfer of orphaned collections to secure institutions	On Track Process for transfer of McGregor Museum Mollusc collection to KwaZulu-Natal Museum underway. Planned relocation: Malawi cichlid collection from Penn State University in the USA to SAIAB; University of Zululand Herbarium to Bews Herbarium, UKZN.
	-Development of a tool for institutions to track improvement of collection management and curation practice on an ongoing basis	Achieved Tracking tool developed and in process of being rolled out to institutions.

Strategic Objective	2024/25 Deliverables	Progress 1 April 2024 to 31 March 2025
2. Upgrading and Expanding Databases	- Investigation and piloting of optical text recognition for digitisation of specimen label data	Delayed, in progress University of Michigan platform (Vouchervision) is under ongoing development. Testing and implementation to commence with appointment of Data Quality Specialist.
	- Review and analysis of status of specimen data sets	On Track Analysis scripts developed and used for herpetology data analysis, which was presented at the Herpetological Association of Africa Conference in November 2024. Most vertebrate datasets have been received from partner institutions, though there are still issues accessing data from one institution. Data for other vertebrate groups are being processed with analysis to follow. A data access meeting is scheduled for April with curator and collection staff to discuss outstanding dataset access.
	-Review of existing data published on GBIF to assess extent and quality of data	On Track Scripts developed to access GBIF API to extract data for South African publishing institutions. Data extracted and datasets created. Data analysis in progress and report in preparation. Workflow, technical requirements and procedures established for generating specimen data from Specify to GBIF. Backend tracking system conceptualised and in development. Data for Herpetology collections reported on at Herpetological Association of Africa Conference in November 2024.
	- Establishment of a Community of Practice for data management	Achieved Communities of Practice framework launched in August 2024, first session on data management held in November 2024.
3. Virtual Museum	- Setup online Virtual Museum architecture	Delayed, in progress Work plan for architecture set up completed, set up and testing underway.
	- Population of Virtual Museum with images and datasets	Delayed, in progress

Strategic Objective	2024/25 Deliverables	Progress 1 April 2024 to 31 March 2025
		To commence once architecture set up is complete. Metadata standards for images and documents developed.
	-Specimen imaging: type specimens: 800 vertebrates and fossils; plant specimens: 160,000	Achieved 255,181 plant specimens imaged for 2024/25 financial year, 1,828 vertebrate and fossil type specimens imaged for the 2024/25 financial year.
	-Digitisation of archival documents related to collections: 100 documents	Achieved 1,038 documents imaged at National Herbarium, SANBI.
	Tracking system for monitoring and recording use of the images, and digitized documents	On Track Initial research for online digital assets tracking commenced.
4. Research Outputs and Impact	- 100 publications produced by researchers using collections - 80 new species described from the collections - 100 scientists visiting the collections for research purposes - 50 loans of specimens sent out for research - 20 MSc, PhD and Postdocs using collections for their research - use of collections for identification of biological specimens	Achieved April 2024 to March 2025: -161 papers published -119 new species described -948 national visitors -206 international visitors -10,566 specimens sent out on loan -309 postgraduate students using the collections -2,110,910 specimens identified
	- Framework developed for assessment of use and impact of research outputs from collections	Delayed, in progress Initial session with community held during Forum in March, follow up session planned.
5. Outreach and Communication	- Pilot video on collections and iconic specimens	On Track Pilot video produced, editing stage underway.
	- Promote NSCF at outreach events	Achieved - Science awareness outreach in the Vhembe East and West education districts of Limpopo Province hosted by Nelson Mandela University (NMU) and the University of Venda (UNIVEN). Date: 6-10 May 2024. Audience: grade 10-12 learners. A total of 1338 learners were reached. - Presented at the Communicating Discovery Science Symposium on 18 to 20 November 2024:

Strategic Objective	2024/25 Deliverables	Progress 1 April 2024 to 31 March 2025
		https://youtu.be/ra_luepUyV8?si=NQbtOcIG2-b6jmAp - Attended the SAASTEC Conference on 25 to 28 November 2024 - Exhibited at Science Forum South Africa on 4 to 6 December 2024 and was interviewed by the DSTI: https://x.com/i/status/1869663333982343428 - Exhibited at University of Pretoria HGWJ Schweickerdt Herbarium Centenary Exhibition on 4 March 2025.
	- Maintenance and regular posts of news items on the NSCF website and Facebook page	Achieved Website and Facebook page maintained with current information and news items, weekly updates.
	- Monitoring and analysis of views and visitors to online platforms	Achieved Website views: 266,858 Website visitors: 150,045 Facebook page followers: 1,017 Instagram followers: 290 Twitter (X) followers: 249 LinkedIn followers: 154 Facebook group members: 453 WhatsApp group members: 149
6. African and International Engagement	- Participation in international conferences, Specify Software Consortium	Achieved -4 hub members and 3 staff from partner institutions attended the Society for the Preservaion of Natural History Collections and Biodiversity Information Standards joint conference virtually from 2 to 6 September 2024. Presented on the collections assessment process. - Specify consortium country membership renewed and participated in committee meetings (Technical Advisory Committee and Board meetings).
	- Assess interest from African institutions in NSCF activities	On Track List of possible contacts compiled. Engagement planned during G20 Seminar.

Strategic Objective	2024/25 Deliverables	Progress 1 April 2024 to 31 March 2025
Governance & Networking	- Meetings of Advisory Committee (twice a year); Co-ordinating Committee (3 times a year)	Achieved Advisory Committee meeting held in July 2024, Coordinating Committee meeting held in August 2024 and February 2025, various engagement sessions held with Directors of institutions and managers of collections during the collections assessment process.
	- Six monthly and final report to DSTI; quarterly report to SANBI EXCO / Board.	Achieved Six monthly reports submitted to DSTI, and quarterly reports submitted to SANBI (EXCO/Board).
	- Develop new Collaboration Agreements / addenda with partner institutions.	On Track Collaboration agreements renewed with 15 partners (SAIAB, WITS Evolutionary Studies Institute and UKZN Bews Herbarium in progress).
Enabling Strategy: Capacity Development Organisational Strengthening and Transformation	- Participation in online training course in collection management and curation for 2 NSCF Hub staff	Achieved -2 hub staff completed online international training course on collections management hosted by Transcending Science in April 2024.
	- Emerging leaders development (32 staff from participating institutions and the NSCF Hub).	On Track - First Emerging Leaders session held in Cape Town from 8 to 12 April 2024, with 28 participants from participating institutions and the hub. Planning for the second workshop underway.
Enabling Strategy: Staffing	- Team and individual development of the NSCF Hub and project-related staff: 17 staff	Achieved -Specimen Photographer attended Digital Imaging for Biodiversity Collections Course hosted by the iDigBio Digitisation Academy from 9 to 12 July. - Two hub members attended the BioDATA Advanced Course on data use with GBIF held in Skukuza during 18-21 November 2024.

Strategic Objective	2024/25 Deliverables	Progress 1 April 2024 to 31 March 2025
		-Hub members attended various symposia, community engagements and conferences in science communication, Living Atlas of Australia training and optical text recognition.
	- Participating institutions: Approx. 20 short term contracts (up to 6 months) and internships for recent graduates / to develop capacity and assist with curation activities / data capture and digitisation; 4 Curation Technicians to assist with integration of orphan collections; imaging of type specimens, imaging of plant specimens, digitisation of documents.	On Track -3 short term research assistants were employed to assist with imaging of herbarium plant specimens at partner institutions. -2 curation technicians at Moss Herbarium, Wits, to incorporate Buffelskloof collection, 2 specimen photographers at SAIAB to image type specimens, 1 specimen photographer at Iziko and 1 at Ditsong to image vertebrate and fossil type specimens
Enabling Strategy: Transformation and Organisational Development	- Interventions at selected institutions to support organisational strengthening	On Track New contract with organisational development consultants started in October 2024 for a two and a half year period and interventions at institutions initiated
	- NSCF Forum for staff from 17 participating institutions (140 staff)	Achieved The NSCF Virtual Forum 2025 took place from 25 to 28 March 2025. 139 members of the NSCF Community attended.
	- Communication platforms for the NSCF network – website, Facebook page, WhatsApp group.	Achieved Website, WhatsApp group, Facebook page and group, Instagram and Twitter accounts operational, news circulated via mailing list regularly, on an ad hoc basis.

4. Financial analysis

Income:

The grant for the 2024/25 financial year was transferred to SANBI's bank account in November 2024. The **total project income to date is R143,286,391.**

Expenditure to date is R136,977,661:

- Human Resources and support services costs amounted to R60,615,975.

- Non HR Operational Costs totalled R43,978,524.
- Capital Expenditure amounted to R32,383,162 which included payments to collaboration partners for the purchase of freezers, microscopes, x-ray machine, ethanol recycler, dehumidifiers, cabinets, compactor shelving and small items for curation of collections and research. This also included procurement of imaging equipment for specimen photography and archival document digitisation.

We have accrued R7,433,888 in interest to date.

5. Financial information

A detailed financial report for the project (provided by SANBI's Finance Division and approved by the Director, Finance), is provided. This report forms the basis of the financial information presented below on income, expenditure and commitments for the 2021/22, 2022/23, 2023/24 and 2024/25 financial years:

Budget vs Expenditure:

Period: 2024/2025

Description	Budget Allocation					Actual			
	2021/22	2022/2023	2023/2024	2024/25	TOTAL	2021/22	2022/2023	2023/2024	2024/2025
Opening Balance					**-**	**10 442 626**	**13 624 648**	**6 574 310**	**9 511 310**
Opening Balance						10 954 433	13 611 316	6 619 185	9 511 310
Prior period adjusted						-511 807	13 332	-44 875	
Income	**18 971 020**	**19 065 285**	**18 215 100**		**75 333 507**	**19 461 402**	**10 597 974**	**19 371 919**	**19 961 834**
Grant	18 971 020	19 065 285	18 215 100	19 082 102	**75 333 507**	18 971 020	10 000 000	18 215 100	19 082 102
Interest earned						490 382	597 974	1 156 819	879 731.90
Expenditure	**18 971 020**	**19 065 285**	**18 215 100**	**19 082 102**	**75 333 507**	**16 292 712**	**17 603 438**	**16 434 919**	**15 722 537**
Human Resources and Support Services	**10 177 850**	**11 834 252**	**12 473 363**	**6 208 111**	**40 693 576**	**9 721 849**	**9 979 051**	**8 674 183**	**10 332 047**
Operational Expenditure	**5 171 789**	**5 331 033**	**5 041 737**	**9 051 787**	**24 596 346**	**3 297 371**	**5 105 937**	**5 951 283**	**5 235 790**
Training & research support (including workshops)	1 348 320	1 400 000	1 326 610	2 700 000	**6 774 930**	34 456	79 810	93 348	256 775
Fixed annual operational cost	50 000	690 000	1 037 140	3 258 233	**5 035 373**	702 160	1 477 577	1 322 552	830 152
Travel & accomodation	760 000	471 769	590 000	985 344	**2 807 113**	208 238	1 108 689	1 672 725	1 363 420
Consumables for office, collections upgrades	1 116 449	862 736	266 477	200 000	**2 245 662**	455 416	1 439 861	1 041 148	877 231
SANBI overheads charge (10%)	1 897 020	1 906 528	1 821 510	1 908 210	**7 533 268**	1 897 102	1 000 000	1 821 510	1 908 210
Capital Investments	**3 621 381**	**1 900 000**	**700 000**	**3 822 204**	**10 043 585**	**3 273 492**	**2 518 449**	**1 809 453**	**154 700**
Webservers & networking	3 470 070	1 300 000	500 000	3 181 204	**8 451 274**	3 273 492	2 518 449	1 809 453	154 700
Equipment				80 000	**80 000**				
Workstations	151 311	600 000	200 000	561 000	**1 512 311**				
Closing balance						**13 611 316**	**6 619 185**	**9 511 310**	**13 750 608**
Less total interest accumulated to dated									**- 7 433 888**
Total balance as at 31.03.2025									**6 316 720**

Financial summary:

Total Project Income	**R143,286,391**
Total Project Expenditure	**-R136,977,661**
Balance	**R6,308,730**

*R7,433,888 interest earned not included in the table above

Details of financial commitments:

There are several commitments at various stages of finalisation, and with various actions that are required before payments can be transferred from SANBI's accounts. These are commitments against signed staff contracts, and service provider contracts for which the project is obliged by SANBI to keep the committed funds in the project cost centre. Commitments against actual signed contracts are detailed in the table below.

Salary costs, contracts and agreements (committed through contracts, and required to be retained in cost centre by SANBI)

Item	Expected date of finalisation	Amount
Short term contract staff at institutions (research assistants)	October 2025	R115,200
Service provider for website maintenance and technical support	May 2026	R201,820
Service provider for organisational transformation and development process	March 2027	R3,017,032
Collaboration agreement with KwaZulu-Natal Museum	October 2025	R160,000
TOTAL		**R3,494,052**

Staff contracts for 20 NSCF Hub staff appointed at SANBI and at institutions(dependent on funding)

Item	Expected date of finalisation	Amount
Staff contracts	January 2028	R16,567,066
TOTAL		**R16,567,066**

6. Summary and assessment

Achievements 1 April 2024 to 31 March 2025:

1. Integrated monitoring of outputs from the use of the collections has been carried out, and illustrates the value of the collections as research infrastructure: 290 requests for data serviced, with 97,848 specimen records provided; 948 national visitors and 206 international visitors using the collections; 119 new species described using the collections; 161 peer-reviewed papers published where the collections were used; the number of postgraduate students who used the collections was 309 (note that the same student may be counted more than once if they used more than one institution's collections). Eighteen institutions submitted reports through the online monitoring system. Institutions reported the following outputs for the 2024/25 financial year:

Indicator	Q1	Q2	Q3	Q4	Year Total
Orphan collections: no. of specimens incorporated	533	2804	3161	1242	**7740**
New specimens accessioned	28754	68111	63622	10208	**170695**
Number of DNA samples added	40	31	0	42	**113**
Number of tissue samples added	162	266	27	126	**581**
Number of DNA samples supplied for research purposes	251	648	40	347	**1286**
Data provided to external users: no. of requests	96	88	34	72	**290**
Data provided to external users: no. of records	15520	12700	26670	42958	**97848**
Number of new specimen records added to Brahms/Specify	8980	11208	13214	12851	**46253**
Number of specimens imaged	482	41455	17568	19300	**78805**
Number of specimens sent out on loan for research	876	2921	124	6645	**10566**
Number of visitors using collection (national)	181	381	179	207	**948**
Number of visitors using collection (international)	33	81	56	36	**206**
Number of new species described	30	30	15	44	**119**
Number of papers published based on collection	20	47	38	56	**161**
Number of papers open access	7	22	22	9	**60**
Number of specimens identified: external stakeholders	1299240	79288	328746	403636	**2110910**
Number of outreach activities held	87	63	24	32	**206**
Number of learners/attendees exposed to the activity	7945	5165	6097	5978	**25185**
Number of postgrad students using the collection	79	73	77	80	**309**
Number of students trained in the collections	58	7	13	31	**109**
Number of students graduated from using the collections	3	7	11	6	**27**
Number of Biodiversity Management and Policy Input Activities		3	2	7	**12**

These figures illustrate the extensive use of the collections and associated services, and the high number of outputs.

2. **Translational outputs: the collections are used as a reference for the identification of materials** in **agriculture** (crop pests, livestock disease vectors and parasites, weed biocontrol agents, phytosanitary diagnostics for import and export of produce), **health** (eg. outbreak of head lice at a school), **environmental impact assessments** for development applications, postgraduate studies and for researchers in a number of different disciplines, and for the general public: 2,110,910 specimens have been identified for the 2024/25 financial year. The impacts of not having the correct identification include the loss of crops and livestock, or a global ban on export of produce, and delays in approvals for development applications or the loss of biodiversity through development.

3. Outreach activities were held as follows:

The NSCF was invited by UNIVEN and NMU to the annual science awareness outreach event in the Vhembe East and West education districts of Limpopo Province, from 6-10 May 2024. The outreach was aimed at grade 10-12 learners to inform them about careers in science, and the value of natural science collections to society. Short talks were shared with the learners, with some specimens on the table, to make the information more understandable and relatable. A total of 1338 learners were reached.

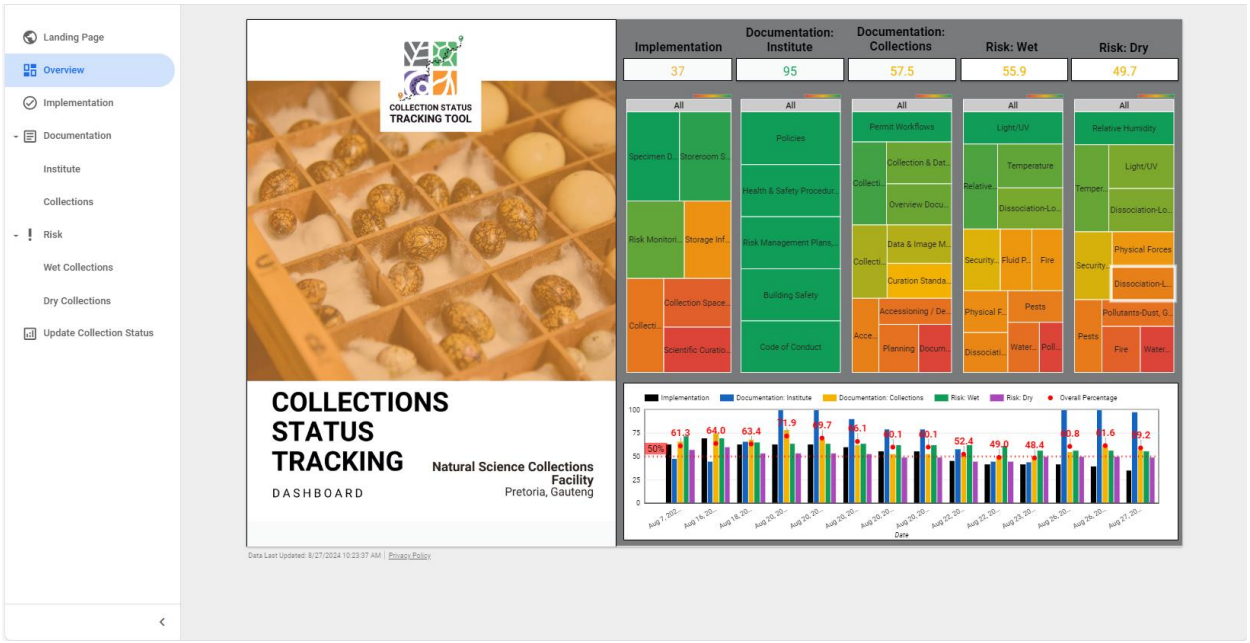
NSCF awareness outreach in the Vhembe East and West education districts of Limpopo Province

We also presented at the Communicating Discovery Science Symposium on 18 to 20 November 2024, attended the SAASTEC Conference on 25 to 28 November 2024, exhibited at Science Forum South Africa on 4 to 6 December 2024 and were interviewed by the DSTI, and exhibited at University of Pretoria HGWJ Schweickerdt Herbarium Centenary Exhibition on 4 March 2025.

4. Collection Status Tracking Tool:

Natural Science Collections Facility
Iqoqwana Initiative
Saving our Past, Securing our Future

A **Collections Status Tracking** Tool was developed by the hub team to assist institutions in tracking progress with implementation of collections and data management practices and standards from a baseline situation based on the result from the collections assessments. The tool is being rolled out to institutions and will serve as a valuable resource to track improvement in collection care and ensuring collection infrastructure is appropriate for safeguarding collections.



Collection Status Tacking Tool Interface

5. Emerging Leaders Development

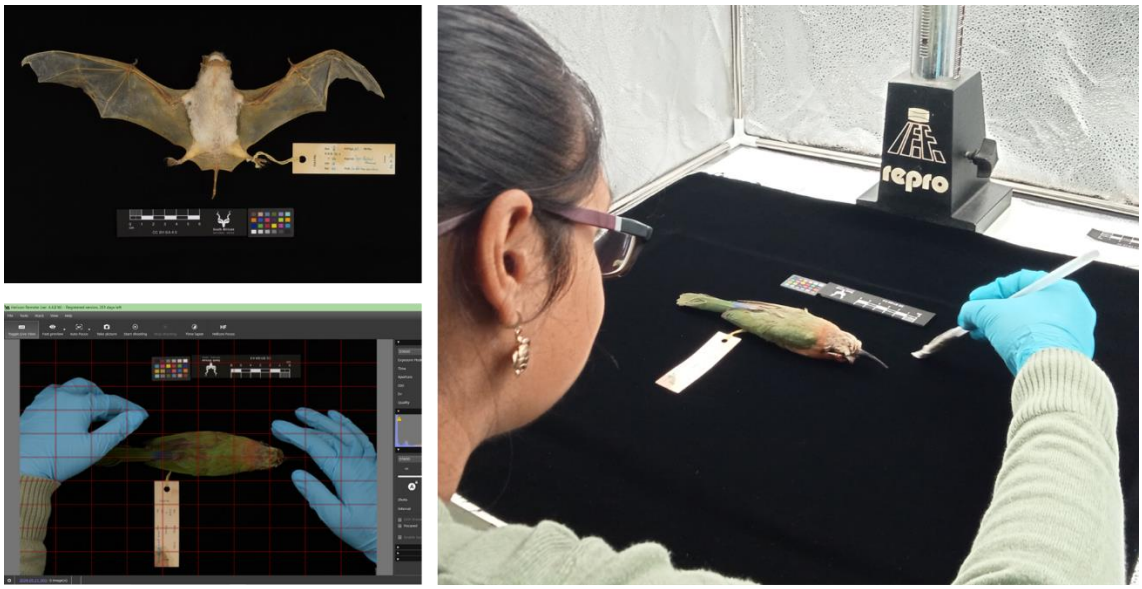
Working with the outcomes of the assessments and implementation of standards and SOPS across institutions requires that new ways of working are designed and piloted, and through a reflective process, revised or modified, taking into account each institution's unique challenges, culture and background but also the need to work as a community of practice. The previous transformation contracts have highlighted the important role that emerging young leaders within the institutions play in effecting change, and development of this community will be an imperative for this phase of the NSCF. The first session with 26 participants from partner institutions and the NSCF hub was held in Cape Town from 8 to 12 April 2024. The session was facilitated by the Organisational Development consultants and covered topics on complexity leadership applied to the NSCF context, competencies for driving change and social technologies for transformation, and participation in communities of practice for capacitation of natural science collection in South Africa.

The next session will take place during May 2025 with 35 participants from partner institutions and the hub.

6. Digitisation of specimens and archival documents for the Virtual Museum

The imaging of herbarium specimens at herbaria across the country has continued with a total of 255,181 plant specimens imaged for 2024/25. 1,828 vertebrates and fossil type specimens were imaged at Ditsong National Museum of Natural History, Iziko South African Museum and the South African Institute for Aquatic Biodiversity. 1,038 archival documents (collectors registers, field notes, collection accession registers) were imaged at the SANBI National Herbarium.

Imaging station setup for plant specimen imaging at various herbaria

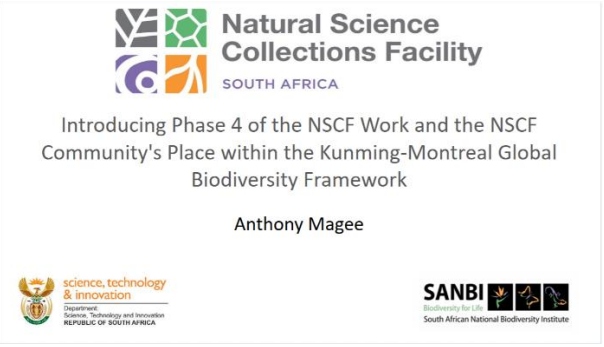


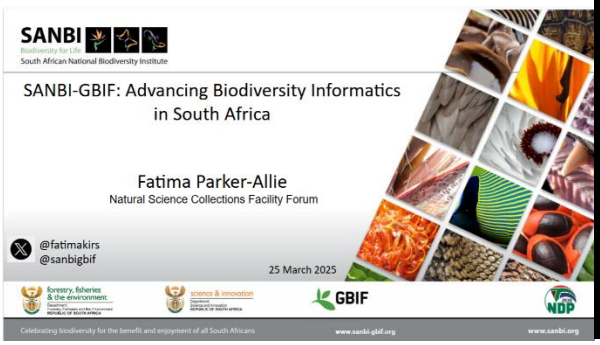
Vertebrate type specimen imaging and training at SANParks

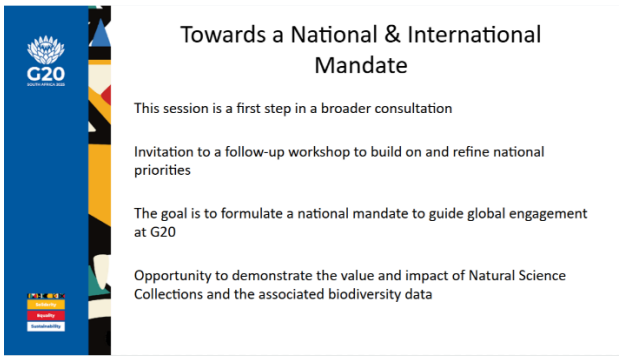
7. NSCF Virtual Forum 2025

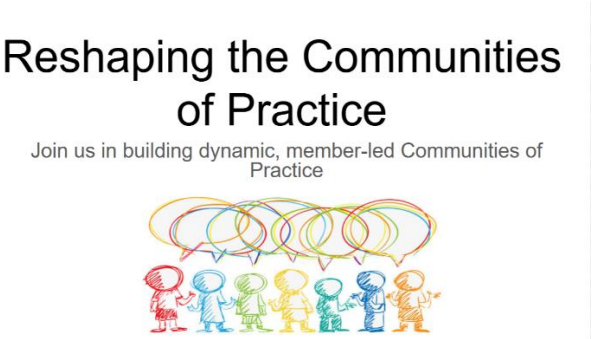
The NSCF Virtual Forum 2025, held from 25 to 28 March, brought together 139 community members around the theme "From Roots to Fruits", using the metaphor of a tree to explore the growth, sustainability, and impact of natural science collections. Each of the four days focused on a different stage of this journey: laying the foundation through the history and policy context of the NSCF; strengthening networks and institutional connections; building sustainable structures through strategy, operations, and communities of practice; and celebrating collective impact, well-being, and future

opportunities. The forum provided a reflective and forward-looking space for participants to share progress, learn from one another, and shape the next phase of the NSCF.









Snapshot of participants and topics covered at NSCF Virtual Forum 2025

Challenges:

1. Operational Challenges. Recruitment of staff, procurement, signing of collaboration and other agreements are all through SANBI systems and getting the required authorisations and support has resulted in significant delays with many activities.

The NSCF is considered as a project within a Division of SANBI, which means that authorisation for agreements, procurement and staffing is often through between four and six signatories above the level of the NSCF Lead. Procurement processes are often very long, with even small items taking up to six months to procure and there have been long periods when computer hardware could not be procured. There is one opportunity per annum to include items over R1 million on the procurement plan. Recruitment processes can take as long as a year, and the minimum requirements and post level are specified by SANBI and not by the NSCF. All these challenges mean that significant efforts are required from most activities and there are delays in implementation of some activities.

2. Cash flow challenges: We are required to retain sufficient funds in the cost centre to cover the full cost of all contracts, including collaboration agreements for institutions and staffing. This results in funds being tied up in two to three year contracts, but we are required by DSI to spend 90% of funds before the next allocation can be drawn.

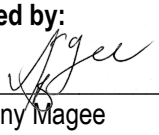
3. Fostering a culture of serving society and accountability in institutions and staff, many of who have previously had a predominantly inward looking and self-serving approach to the collections and research. The new Organisational Development contract will focus on institutional level interventions and working with emerging leaders in institutions.

4. Development of an online virtual museum, Initially integration with SANBI's National Biodiversity Information System was planned. However delays with the implementation meant that an alternative arrangement was required. Living Atlas software (open source) will be used and we have filled a post for virtual museum setup and coordination.

5. NSCF Leadership: Prof Michelle Hamer, the NSCF Lead, retired at the end of October 2024. SANBI advertised the lead post, as a 3-year contract, but was unable to find a suitable candidate. The post was re-advertised, but no suitable candidates were identified. Hub staff are able to implement the Business Plan in the absence of a NSCF Lead as an interim measure, and SANBI appointed an Acting Lead in November 2024.

Approval

Submitted by:



Dr Anthony Magee

Acting NSCF Lead

Date: 20/05/2025

Approved by:

Prof Ramagwai Sebola

Chief Director, Foundational Biodiversity Science

Date: 21/05/2025