

2024/25



THE FRESHWATER
RESEARCH CENTRE



BIANNUAL REPORT







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Reporting Period: March 2023 - February 2024
(2024) and March 2024 – Feb 2025 (2025)

About the FRC

The Freshwater Research Centre (FRC) is a non-profit organisation conducting interdisciplinary research in freshwater science. We promote collaborative, cross-cutting, and policy-relevant research, and develop innovative solutions that balance human water needs with ecological requirements. Our team comprises specialist river and wetland ecologists, with a combined research experience exceeding 150 years.

Freshwater is fundamental to economic prosperity and social well-being, yet its availability is increasingly one of the world's most pressing environmental challenges. As pressures from development and climate change intensify, the sustainable use of water resources is essential if societies are to secure long-term benefits from freshwater ecosystems.

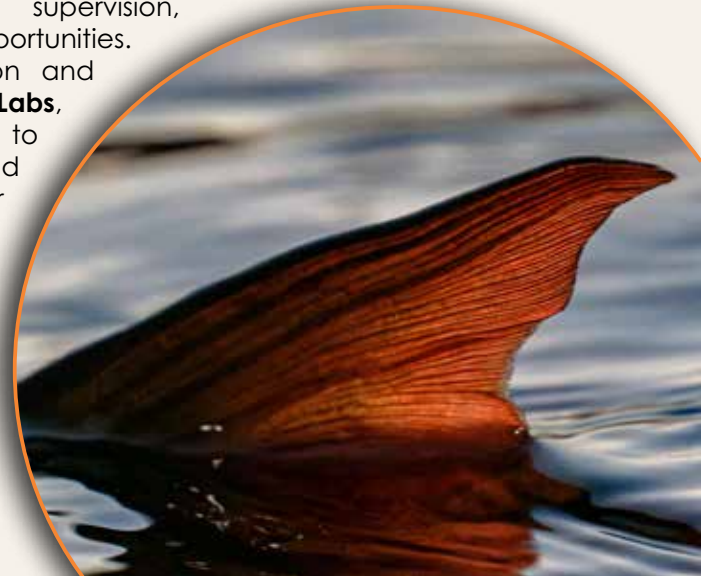
Central to the FRC's work is our **mission to achieve effective stewardship of freshwater ecosystems through collaborative and innovative research, development, and implementation**. We are guided by the conviction that water is not merely a resource, but a vital element sustaining life itself, and that healthy aquatic ecosystems are essential to resilient human societies.

Despite its fundamental value, freshwater is increasingly threatened by human activities that degrade water quality and quantity—particularly in semi-arid regions such as South Africa, where water resources are naturally scarce. Effective stewardship therefore depends on a sound understanding of how freshwater ecosystems are structured and function, and of the ecological consequences of water use.

The FRC's research seeks to deepen this understanding, improve the sustainable use of water resources, and anticipate the impacts of climate change and other human pressures on freshwater ecosystem integrity. Through this work, we generate actionable knowledge on freshwater ecological infrastructure and its value to society, directly informing policy, planning, and management.

Our **vision is to build increased knowledge, capacity, and practice that support healthy freshwater ecosystems and resilient water futures across Africa**. To realise this vision, we undertake collaborative, data-driven, and scientifically defensible research that underpins the effective management, conservation, and rehabilitation of freshwater ecosystems, particularly in southern Africa.

We are committed to excellence in research, training, and education, and to strengthening capacity across the aquatic sciences. We share our knowledge through peer-reviewed publications, technical outputs, and traditional and digital media, and actively support emerging scientists through student supervision, mentoring, and internship opportunities. Our environmental education and outreach programme, **Living Labs**, introduces school groups to the importance, diversity, and value of healthy freshwater ecosystems.





2024–2025 In Review

Over the past two years, our growth has reflected the strength and diversity of our projects, funders, and staff. I am excited to share our journey as we continue to deliver impactful work across our focal areas of conservation, resource protection, bioinformatics, and climate change.

In the 2024 and 2025 fiscal years, we:

Partnered with The Nature Conservancy, through the Greater Cape Town Water Fund, to assess the ecological benefits of invasive alien plant clearing. Using a paired-catchment approach, we are collecting baseline biodiversity and habitat data for fish, frogs, and aquatic invertebrates to better understand how catchment restoration supports biodiversity.

Launched the Fynbos Fish Revival Programme, a flagship conservation initiative led by the FRC in partnership with NGOs, government, local communities, landowners, conservation practitioners, and scientists. The programme aims to improve the conservation status of the Western Cape's ten most threatened freshwater fish species.

Continued our community conservation initiative, Saving Sandfish, to rebuild wild sandfish populations and restore critical habitats for sandfish and other endemic species. To date, 40,000 juvenile sandfish have been rescued and relocated to sanctuary dams, and 3,000 fish have been tagged and released—making this Africa's largest freshwater fish rescue on record.

Restored the Breekkrans River by removing invasive spotted bass from 9 km of otherwise pristine habitat, substantially expanding living space for the fiery redfin and six co-occurring endemic fish species. A 1 m-high barrier weir was subsequently constructed to prevent reinvasion. The project has also strengthened freshwater conservation capacity and created employment opportunities for local community members.

Initiated the "Bring Back the Witvis" project in the Berg River, working with local stakeholders—including fishermen, landowners, and schools—following a 30-year absence of the species. The initiative follows a two-phase approach: establishing sanctuary populations and reintroducing sanctuary-reared fish into the wild.

Identified spatial priority areas for biodiversity and ecosystem services across the Cubango, Cuito, and Cuando headwaters—key tributaries of the Okavango Delta. This conservation planning study represents a critical step in safeguarding the ecological integrity of the Okavango Basin's headwaters and securing sustainable benefits for communities across the Kavango–Zambezi landscape.

Advanced our work in the Koue Bokkeveld, making significant progress in tools, partnerships, and institutional engagement. The Water Balance Tool is evolving into a practical decision-support system to help farmers, regulators, and Water User Associations manage abstraction, dam storage, and river flows at farm and catchment scales.

Completed the Sustainable Water Management project, which developed and tested a comprehensive indicator framework to assess the effectiveness and sustainability of water resource management in South African agricultural catchments.

Initiated projects to strengthen water governance, empowering authorities to manage South Africa's threatened water resources and Strategic Water Source Areas (SWSAs) through capacity development, collaborative governance, and the co-creation of actionable tools and protocols to achieve flow, water quality, and biodiversity outcomes.

Supported the Breede–Olifants Catchment Management Agency and partners in developing an Ecological Infrastructure Management Plan for the upper Breede River.

Completed Phase 2 of the Freshwater Biodiversity Information System (FBIS), a cutting-edge platform for tracking change in South Africa's freshwater biodiversity and consolidating and democratising biodiversity data nationwide.

Developed an online taxa information management system to enable Freshwater Animal Diversity Assessment experts to curate, maintain, and publish taxa lists that interoperate with global data infrastructures.



Developed the Freshwater Information Platform, a global platform for managing and viewing freshwater biodiversity data.

Developed the Biodiversity Information System for South Africa's National Parks, integrating terrestrial, freshwater, and marine biodiversity data to support SANParks' management needs.

Developed an open-access online platform for hosting, analysing, visualising, and sharing freshwater biodiversity data for the Kafue Flats wetlands in Zambia.

Collaborated with partners under the REFRESH project (*Renewing data and filling knowledge gaps for freshwater species of South Africa*) to mobilise existing data and address key information gaps.

Developed FBIS Africa, a continental freshwater biodiversity information system designed to improve access to data, provide advanced analytical tools, and function as a user-friendly African freshwater data repository—supporting conservation and sustainable use of freshwater ecosystems across Africa.

Assessed hybrid flood alleviation options under climate change, with a focus on mapping wetlands and rivers, evaluating ecological condition and biodiversity importance, and assessing ecosystem service delivery across three catchments.

Delivered three SASS training courses, training 25 participants in the SASS5 biomonitoring method, with an additional ten trained in SASS and other rapid bioassessment protocols across Africa.

Continued our Living Labs education and outreach programme, including mini-SASS outings and Saving Sandfish camps. A highlight has been our partnership with Youth 4 Conservation.

Published ten peer-reviewed scientific papers, 20 reports, three popular articles, and four short films, and supervised five PhD students.

Our team at the Freshwater Research Centre remains steadfast in our commitment and passion for this work. We thrive on collaboration and are deeply grateful to the many individuals and organisations with whom we partner. I am especially appreciative of the dedication of our board members, researchers, students, and interns, and indebted to our funders and donors whose continued support makes this work possible.

Helen Dallas
Executive Director
Freshwater Research Centre





Conservation Initiatives

A Paired Catchment experiment with Greater Cape Town Water Fund (The Nature Conservancy), monitoring the effects of invasive alien clearing

Over the past seven years, the Freshwater Research Centre has built a collaborative relationship with The Nature Conservancy (TNC), through the Greater Cape Town Water Fund (GCTWF). The GCTWF has a strong focus on clearing and control of invasive alien plants (IAPs) in order to increase water supply and water security for Cape Town, while ensuring that freshwater biodiversity and ecosystem functioning is maintained or enhanced. The GCTWF has embarked on an ambitious restoration project to clear thirsty invasive plants from seven priority water supply catchments in an effort to increase flow into the City's biggest water supply dams.

In 2020, FRC provided freshwater ecological input to a multi-disciplinary Monitoring and Evaluation (M&E) plan for the targeted removal by the TNC of 55 000 ha of IAPs over six years (2019 – 2025) from seven priority catchments. In the late summer of 2021, 2022, 2024 and 2025 we collected baseline biodiversity and habitat data at sites on six paired catchment tributaries, some of which will be cleared and others left as is. The field surveys revealed a high diversity of aquatic macroinvertebrates at each site - up to 32 families were recorded at a single site, and a very preliminary delve into lower taxonomic levels hints at a complement of approximately 87 species across all the paired catchment tributaries. The majority of these taxa are likely to be endemic to the CFE, and possibly even to these sub-catchments. There is good habitat for amphibians such as the Cape Ghost Frog, *Heleophryne purcelli*, and the Cape River Frog, *Amietia fuscigula*, and illustrated spatial variation in both biodiversity and habitat conditions among the six tributary sites.

Microhabitat preference analyses enabled us to unpack some of the stronger links between species distribution/abundance and key aspects of river habitat: depth, flow and substrate. The discharge surveys provide insight into how available habitat changes with discharge, and by extension, allows for inferences about the influence of pine invasions and clearing on habitat availability for flow-sensitive aquatic organisms.

Funders: The Nature Conservancy

Partners: CapeNature

Project Value: R 1 212 480



Fynbos Fish Revival

Freshwater fish are the most threatened species group in South Africa and the Western Cape Province (also known as the Fynbos Region) is at the epicenter of South Africa's freshwater fish emergency, with a higher proportion of threatened endemic freshwater fish than anywhere else in the country, and perhaps the continent.

Fynbos Fish Revival (FFR) is an urgent conservation initiative spearheaded by the Freshwater Research Centre in partnership with NGOs, government, local communities, landowners, conservationists, and scientists. It aims to reverse the steep decline of endemic freshwater fish species in South Africa's Western Cape by improving the conservation status of the region's 10 most threatened fish species by 2035. This is achieved through a combination of approaches including threatened species reintroduction programmes, habitat restoration, protected area expansion and invasive species removal. Impact to date includes:

- 22 km of vital fish habitat restored
- 9 Endemic fish species positively impacted
- More than 7,000 invasive fish removed
- 20 hectares of riparian habitat cleared of invasive vegetation
- 4,500 endemic fish reintroduced into the wild
- 12 community members trained and employed, totalling >1000 workdays
- 107 high school students directly engaged in conservation activities

Local communities are central to the initiative, and individuals are trained and employed in monitoring and restoration activities. School groups are involved through immersive conservation experiences. Knowledge generated from FFR has been featured in peer-reviewed scientific publications, documentaries and covered by outlets like National Geographic, bioGraphic and CNN.

Partners and funders

Mountain Club South Africa, TotalEnergies, Fordd Wildlife Foundation, IUCN Save Our Species, Mount Ceder, FOSAF, World Fish Migration Foundation, Bushmans Kloof, Cederberg Conservancy, National Geographic Society, The Nature Conservancy, WWF South Africa, Mohammed Bin Zayed Species Conservation Fund, Hans Hoheisen Charitable Trust, Table Mountain Fund, Alu-Cab, The Mission, Youth 4 Conservation, Babylonstoren, CapeNature, Fishwater Films, Rufford Foundation, Gone Outdoor, Western Cape Government, Investec, Caleo, Northern Cape Department of Environment and Nature Conservation, Fynbos Fish Trust, Biomark, Mary Oppenheimer Daughters Foundation, Shoal, Re:Wild, Species Survival Commission.



Saving Sandfish

The Clanwilliam sandfish, endemic to South Africa's Olifants-Doring River system which flows through the Cederberg Mountains, is the country's most threatened, migratory freshwater fish. Once widespread throughout the system, its distribution has contracted and fragmented, to the point where it may have disappeared from the Olifants catchment entirely, leading to its Endangered IUCN conservation status.

The Doring River is the last free-flowing river in South Africa's Cape Fold Ecoregion (CFE) Biodiversity Hotspot, and the last outpost for remaining sandfish populations. However, a recent FRC-led survey of the Doring has revealed that the river has been overrun by invasive alien fish, and that native fish populations (including the sandfish) are in sharp decline. The survey also revealed an absence of young sandfish, which indicates widespread recruitment failure, and a species headed rapidly for extinction.

With only two known tributaries still supporting recruiting sandfish populations, urgent conservation action is required to prevent the sandfish from going extinct. To this end, the Saving Sandfish project was launched in 2019 with the aims of boosting wild sandfish numbers to prevent species extinction in the short-term, and restoring critical habitats for sandfish and other endemic fish species to ensure their long-term survival.

To increase sandfish survival, local community members are employed to rescue and relocate young fish from vulnerable habitats (with invasive fish and excessive water abstraction) in the lower Biedouw River to sandfish sanctuaries created by working with land-owners to remove alien fish from farm dams. To date, over 40,000 juvenile sandfish have been rescued and relocated to the sanctuary dams, where they are reared to a bass-proof size and then released back into the wild. A PIT-tagging study is being used to monitor the survival of the dam-reared fish, and measure the impact of the rescue-rear-release intervention on boosting the wild spawning population of sandfish. To date over 3,000 fish have been tagged and released – an intervention that tripled the Biedouw River spawning sandfish population.

Looking forward, we will be building on these foundations to (1) continue annual sandfish rescues, (2) scale up the sandfish reintroduction programme, (3) monitor the survival and movement of these fish using PIT tag technology, (4) rehabilitate the riparian zone, (5) remove predatory invasive fish from the Biedouw River to

reclaim critical habitat for endemic fish populations and secure the long-term survival of the sandfish and other endemic fishes, and (6) use visual media to raise awareness and support for local freshwater conservation.

Saving Sandfish is a community conservation project that would not be possible without support from our project partners, supporters and funders.

Funders: National Geographic Society, Mohammed Bin Zayed Species Conservation Fund, IUCN Save Our Species, the Ford Wildlife Foundation, IUCN Species Survival Commission, Rufford Foundation, Investec, Federation of Southern African Flyfishers, Bushmanskloof, Mount Ceder, Ford Wildlife Foundation, Alu-Cab

Partners: Fishwater Films, Youth 4 Conservation, Fynbos Fish Trust, CapeNature, Cederberg Conservancy, the Northern Cape Department of Environment and Nature Conservation, Endangered Wildlife Trust, World Fish Migration Foundation, Enjo Nature Farm, Alpha Excelsior Farm, Mertenhof Farm, Hartbesluit Farm, Jai Yen Yen, Bushmans Kloof.

Project Value: R 5,800,000



Breekkrans River Restoration Project

The Breekkrans River Restoration Project focuses on conserving the Critically Endangered Doring River Fiery Redfin (*Pseudobarbus* sp. phlegethon), known from only two small tributaries in the Doring River catchment: the Driehoeks and Breekkrans Rivers. These fish have been displaced from the majority of their native range and relegated to isolated river stretches—often less than 2 km long—due to predation by invasive alien species like spotted bass. With less than 500 individuals left in the wild,

The project has successfully removed 841 spotted bass from approximately 9 km of otherwise pristine river habitat, dramatically expanding the living space for the fiery redfin -and 6 co-occurring endemic fish species - from under 2 km to now potentially up to 10 km. To prevent bass from reinvading the restored sections, a 1m-high barrier weir has been constructed at the downstream end of the restoration zone. The restoration work has involved four local community members, providing them with employment and valuable training while contributing to local conservation capacity building.

Detailed scientific surveys are now underway to track the recolonisation of the restores section of river and confirm that bass eradication has been 100% successful.

Funders: TotalEnergies, Mountain Club South Africa, Ford Wildlife Foundation, Alu-Cab, Private donors

Partners: Fynbos Fish Trust, CapeNature, Cederberg Conservancy, Mountain Club South Africa, Breekkrans Trust, Fishwater Films

Project Value: R 2,800,000



Bringing Back the Witvis

Bringing Back the Witvis is a targeted conservation initiative aimed at reintroducing the Berg-Breede Witvis (*Cheilobarbus capensis*), an endangered freshwater fish species, back into the Berg River in South Africa after a 30-year absence. Once abundant in the Berg and Breede Rivers in the Western Cape, the Witvis population declined sharply due to habitat degradation, water pollution, and predation by invasive species such as smallmouth bass, leading to its local extinction in the Berg River by the 1990s.

The project is led by the Freshwater Research Centre, with key support from partners including the Ford Wildlife Foundation (FWF), the Table Mountain Fund, CapeNature, Fynbos Fish Trust, and local landowners including Boschendal and Babylonstoren. It is part of the broader Fynbos Fish Revival initiative focused on restoring threatened native freshwater fish species in this unique ecosystem. The approach involves a two-phase strategy, including establishing sanctuary populations, and then reintroducing sanctuary-reared fish back into the wild.

The team has identified and secured safe breeding sites in farm dams within the Berg River catchment area. For example, Bluegum Dam, located at the foot of the Simonsberg Mountains on Babylonstoren Wine Estate, is a critical nursery site where Witvis are reared and allowed to grow to maturity in a controlled environment safe from invasive predators.

Once the fish reach suitable age and size, they are reintroduced into sections of the Berg River where habitat improvements and reduced bass populations present favorable conditions for survival. Recent surveys show that threats like bass have declined and water quality has improved, creating a window of opportunity to successfully re-establish wild populations.

The project also places strong emphasis on collaboration with local stakeholders, including fishermen, landowners, and schools, to raise awareness and ensure sustained community support for long-term conservation success.

Significant outcomes expected from the project include ecological restoration of a key native fish species that plays an important role in river ecosystem balance, along with economic and recreational benefits such as enhanced fly-fishing opportunities—a valued activity in the region that can stimulate eco-tourism.

Funders: Table Mountain Fund, Boschendal, Ford Wildlife Foundation, Alu-Cab

Partners: Babylonstoren, Boschendal Estate, Western Cape Government

Project Value: R 900,000



Kavango Zambezi Transfrontier Freshwater Ecosystems Systematic Conservation Planning Study



In 2024, the freshwater conservation planning work in southeast Angola achieved a significant milestone. The final technical report was completed in July 2024, identifying spatial priority areas for biodiversity and ecosystem services across the Cubango, Cuito, and Cuando headwaters—critical tributaries of the Okavango Delta.

This work—led by WWF-Zambia in collaboration with The Nature Conservancy, Peace Parks Foundation, and Angolan agencies—used a systematic conservation planning approach. It drew on over 170 biophysical and biodiversity features and applied global targets (30x30) to prioritize areas with high ecological value and strategic water source importance.

To present and validate these findings, a regional stakeholder workshop was held at the Palmeiras Suite Hotel in Luanda, Angola, from October 9–10, 2024. The event brought together over 40 representatives from national ministries, provincial authorities, NGOs, academia, and community groups. The workshop focused on two key mapping efforts: freshwater and terrestrial conservation values, and source water protection planning.

The objectives included validating spatial data and prioritization results, aligning on a shared vision for implementation, and identifying concrete pathways for integrating the maps into national and local land-use decisions. Participants reviewed outputs from the Marxan-based analyses, provided structured feedback on the conservation values framework, and co-developed a draft implementation plan.

The workshop concluded with a consensus on actionable steps, including the use of the results to support park rezoning, the identification of new conservation areas, and supporting proposed nominations for a Ramsar Site and a Biosphere Reserve in the Cuito-Cuando region.

We are now in the final stages of preparing a peer-reviewed publication and are supporting Angolan partners in embedding the outputs into national conservation and spatial planning policies. This marks a crucial step in protecting the ecological integrity of the Okavango Basin's headwaters and securing sustainable benefits for communities across the KAZA landscape.

Funders: WWF-Zambia

Partners: WWF-Zambia, The Nature Conservancy, Associação de Conservação do Ambiente e Desenvolvimento Integrado Rural, Peace Parks Foundation, Zambezi Watercourse Commission, Gabinete para a Administração da Bacia Hidrográfica do rio Cunene, and OKACOM and the National Water Resources Institute; Instituto Nacional de Recursos Hídricos. National Geographic Okavango Wilderness Project.

Project Value: R 811,324.00



Resource Protection

A multi-stakeholder approach to enhancing sustainable water management and agricultural practices for the benefit of people and the environment in the Koue Bokkeveld

The 2024–25 reporting period marked a pivotal moment for our work in the Koue Bokkeveld, with significant progress made on tools, partnerships, and institutional engagement. The Water Balance Tool (WBT), now nearing software completion, continues to evolve into a practical decision-support system that will allow farmers, regulators, and Water User Associations (WUAs) to better manage water abstraction, dam storage, and river flows at both the farm and catchment scale. Its design ensures that users can assess water availability, test climate and abstraction scenarios, and measure compliance with the Ecological Reserve.

We completed the calibration of the WBT for the Twee River catchment using real-time flow and rainfall data, with technical refinements underway to prepare for application in the Verlorenvlei catchment in 2025. A notable advance was the “Sharing the Pain” module, which equitably distributes water shortfalls among users during times of scarcity, ensuring downstream ecosystems are not left dry.

Our field-based monitoring network has generated invaluable hydrological data to support modelling, stakeholder engagement, and conservation planning. Although one Suurvlei River station was lost during a flood event, we are working to replace it and upgrade existing loggers with satellite transponders for real-time mobile data access.

Beyond modelling, real-world conservation outcomes remain a core focus. Our catchment coordinator, Stefan Theron, secured funding to clear an additional 855 hectares of alien invasive vegetation. Since project inception, more than 1,300 hectares have been cleared. We also celebrated the gazettement of the 8,967 ha Twee Rivieren Nature Reserve—now a cornerstone of aquatic and terrestrial biodiversity protection in the region.

The Koue Bokkeveld approach continues to gain traction as a model of good practice. With ongoing support from Hans Hoheisen Charitable Trust and partners, the project is poised to expand both its technical reach and conservation impact in the years ahead.

Funders: Hans Hoheisen Charitable Trust, WWF-SA, Department of Agriculture Western Cape, Water Research Commission of South Africa (WRC).

Partners: WWF-SA, Department of Agriculture Western Cape Landcare Programme, French National Research Institute for Agriculture, Food and Environment (INRAE), Koue Bokkeveld Water Users Association.

Project Value: R 1,142,460



Hans King surveying a site on the Suurvlei River



Refining and testing a Sustainable Water Management Indicator Framework for South African agricultural catchments

The Sustainable Water Management (SWM) project developed and tested a comprehensive indicator framework to assess the effectiveness and sustainability of water resources management in South African agricultural catchments. Led by the Freshwater Research Centre in partnership with GEOSS South Africa, the project refined an existing WWF-UK framework to better reflect South Africa's legal, institutional, and hydrological context, with a strong emphasis on Environmental Flows (E-Flows) and groundwater sustainability.

The framework moves beyond farm-level assessments by evaluating water use and governance at a catchment scale, recognising that sustainable agricultural sourcing depends on the cumulative condition of rivers, aquifers, and wetlands. It integrates 17 indicator groups spanning legislation and institutional mandates, planning and allocation, implementation capacity, monitoring, compliance, outcomes, and adaptive management for both surface water and groundwater. Indicators are scored using a structured, evidence-based methodology and spatially represented through GIS at HydroBasin level, enabling clear visualisation of risks and performance.

The framework was applied across priority agricultural regions in South Africa, including the West Coast, Olifants–Doring, Breede, Gouritz, Berg–Overberg, Eastern Cape, Orange–Vaal, and Limpopo–Inkomati systems. Results highlight a consistent pattern: South Africa has strong water legislation and well-developed technical methodologies, but sustainability outcomes are constrained by limited human capacity, inadequate monitoring infrastructure, weak compliance enforcement, and slow operationalisation of E-Flows and groundwater controls.

Overall, the project demonstrates the SWM Framework's value as both an assessment and decision-support tool. It provides a transparent basis for identifying priority catchments, guiding targeted interventions, supporting retailer and industry engagement, and strengthening accountability for sustainable water management in agricultural supply chains.

Funders: WWF-UK

Partners: WWF-UK, Groundwater & Earth Sciences (GEOSS)

Project Value: R 640 115.00

Empowering mandated authorities to manage South Africa's threatened strategic water source areas and catchments

Whilst South Africa has developed excellent policies, methodologies and targets for water resources protection, implementation remains a critical challenge. Mandated authorities face increasing pressure to "implement the Reserve and Resource Quality Objectives" (RQO) and yet there is no guidance nor protocols for doing so. The failure to track compliance, regulate unlawful use and report progress has led to criticism and disenchantment. Moreover, there is a key need to link the threatened Strategic Water Source Areas (SWSAs) and their catchments, declining flow and water quality to environmental and human well-being so that it is regarded as important by stakeholders in general. These SWSAs cover only about 10% of the land area but produce roughly 50% of the region's surface water runoff. These small, high-yield "water factories" are therefore disproportionately important for national water security. The urgency to build resilience and protect SWSAs for water security in a climate-changing world with increased water demands is evident in the project area with the deepening drought where the CMA and partners face extreme pressure to address the growing water crisis.

The FRC is addressing this implementation challenge through a novel, systemic approach which highlights potential risks of declining environmental integrity. Moreover, ensuring that this is embedded within the new Catchment Management Strategy as well as other relevant plans. The project unfolds over two and a half years, piloted in the Breede-Gouritz catchments and expanded nationally with all CMAs.

The aim is to empower water management authorities to manage South Africa's threatened water resources and SWSAs through enhanced collaborative governance, capacity and practices for implementation. This will be collaboratively developed and tested in the Breede-Gouritz Catchments and upscaled to the Breede-Olifants and incoming CMAs.

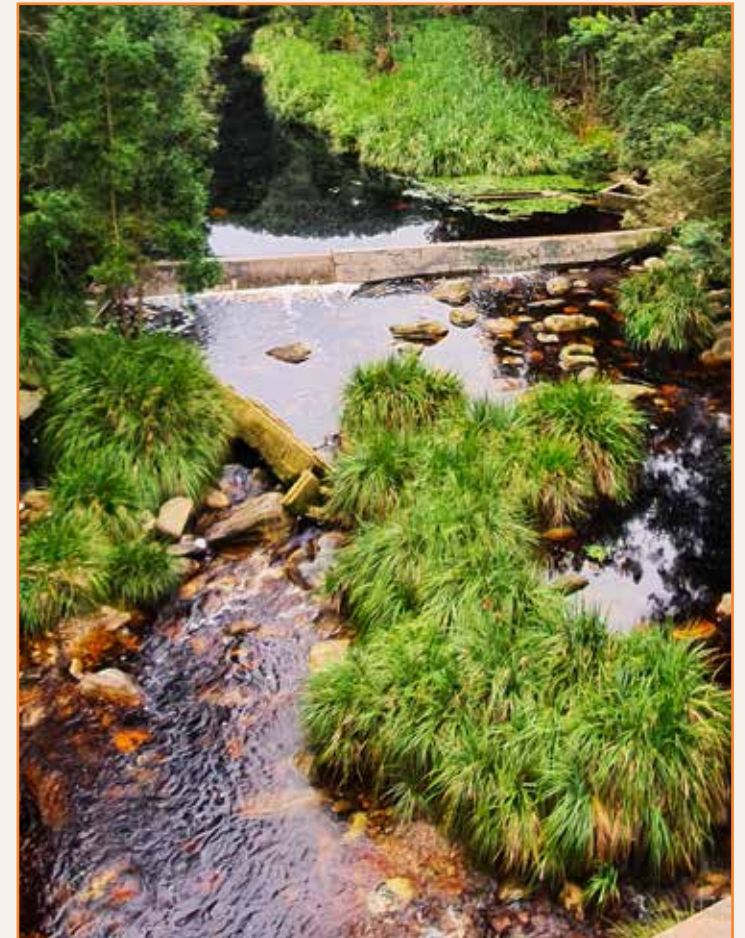


The team has concentrated on unravelling and analysing the Reserve and Resource Quality Objectives (RQOs) for flow, with work on water quality objectives now underway. Translating these into practical measures for compliance monitoring has proven complex, often requiring expertise beyond current staff capacity and further hindered by challenges such as dysfunctional gauge stations. Despite these obstacles, a methodology for converting flow requirements into a workable compliance monitoring approach has been developed, together with a simple dashboard, and the first in a series of successful capacity-building workshops has been delivered with key partners. Parallel efforts have focused on priority measures for protecting Strategic Water Source Areas (SWSAs) and advancing the development of the impact-based framework.

Funders: Green Trust (Nedbank) – supported by WWF-SA.

Partners: Breede-Olifants Catchment Management Agency (BOCMA); Department of Water & Sanitation, SANParks, Inkomati-Usuthu CMA, CapeNature, Biosphere Reserves, WRC.

Project Value: R 3 089 813



Policy Implementation for Water Resources and Biodiversity Protection through Capacity Building of Water Managers in South Africa

As noted, South Africa's freshwater ecosystems face severe pressures, and despite strong policy frameworks and legally mandated targets, institutions lack the guidance, tools, and capacity to monitor compliance against these benchmarks — including those critical for safeguarding freshwater biodiversity — and to enforce measures effectively, leaving biodiversity protection at risk. Equally important, reporting on outcomes in ways that resonate with the public and stakeholders — including local authorities — remains weak. This gap has eroded public confidence and placed vital biodiversity assets at risk. Supporting Catchment Management Agencies (CMAs) and partners to implement these measures is therefore essential, particularly as new CMAs assume responsibility for water resource protection. This institutional change presents a unique opportunity to strengthen policy implementation through the development of skills, practices, and tools for mandated authorities.

In response, the Department of Water and the newly established Breede-Gouritz Catchment Management Agency (CMA) requested support, with the four incoming CMAs facing similar challenges. The Freshwater Research Centre (FRC) is working with the Breede-Olifants CMA, alongside the Department of Water and Sanitation, SANParks and other partners to build capacity for freshwater biodiversity protection. This multi year, collaborative learning initiative is designed to improve implementation practices across South Africa's Water Management Areas (WMAs). The programme focuses on empowering authorities through capacity development, collaborative governance, and the co creation of actionable tools and protocols to achieve flow, water quality, and biodiversity outcomes. This initiative emphasises the protection of aquatic biodiversity while strengthening institutional capacity and confidence to implement water resource and biodiversity protection measures

The team has focussed on developing methodologies for compliance monitoring for flow, water quality and biota. The work on water quality and biomonitoring is currently underway, revealing several challenges such as the lack of any real-time water quality gauges and biomonitoring protocols that can be streamlined and integrated into local reporting practices. The first in a series of successful capacity-building workshops on flow compliance monitoring has been delivered with key partners and provided a framework for further training. Parallel efforts have focused on support for data collection and use of the FBIS system developed by the FRC (ref to this in doc).

Funders: JRS Foundation

Partners: Breede-Olifants Catchment Management Agency (BOCMA); Department of Water & Sanitation, SANParks, Inkomati-Usuthu CMA, CapeNature, Biosphere Reserves, Department of Environmental Affairs & Forestry, WRC

Project Value: R 2 669 744.00



Collaborating with the Breede-Olifants Catchment Management Agency (BOCMA) to develop one of South Africa's first Ecological Infrastructure Management Plans

The FRC supported the Breede-Olifants Catchment Management Agency (BOCMA) and partners to develop an Ecological Infrastructure Management Plan (EIMP) for the upper Breede River, in two quaternary catchments (H10F and H10G). This project was nested in a national project known as the EI4WS Project (Ecological Infrastructure for Water Security), and alongside the EIMP for the Umgeni River Catchment. This EIMP is the first of such pioneering initiatives being developed in South Africa.

The Upper Breede is home to important rivers such as the Upper Breede, Slanghoek, Wabooms and Molenaars Rivers. It is also an area of high terrestrial and freshwater biodiversity. The catchment hosts the Kluitjieskraal wetland near Wolseley, and feeds the extensive Papenkuils wetland near Worcester. In terms of land and water-use it is an area of intense agricultural production—mainly citrus and vineyards which are heavily reliant on the catchments' waters. The area comprises both surface and groundwater Strategic Water Source areas.

Ecological Infrastructure (EI) includes rivers, wetlands and groundwater. These ecosystems offer essential ecosystem services – such as streamflow regulation, flood alleviation and water quality improvement – that are critical for water security. Maintaining EI in good condition ensures the supply of a diversity of ecosystem services, and thus cost-savings for water users.

A key aspect of the EIMP was to ensure that stakeholders understood the vital role of EI and are invested in a future which includes the protection and management of EI. The EIMP project team engaged with multiple stakeholders in the Upper Breede River catchment, to collaboratively identify key water-related EI in the study area, and to assess and prioritise EI for protection, maintenance and rehabilitation. This involved working in the field with local farmers, farm managers, scientists, and water user representatives, alongside several stakeholder meetings. Through this iterative process, twelve priority EI areas were identified and described, all of which contribute to a library of projects for future EI investment.

The methods that were devised for the identification and prioritisation of key EI in the catchment were written up as a guide for the BOCMA (and others) to develop EIMPs in other areas.

Funder: Breede-Olifants Catchment Management Agency

Partners: BOCMA, the South African National Biodiversity Institute (SANBI), the Department of Water and Sanitation (DWS), the farmers of the Upper Breede River catchment.

Project value: R 455 200



Bioinformatics

Freshwater Biodiversity Information System (FBIS)

The Freshwater Biodiversity Information System (FBIS) is a powerful, open-access, and user-friendly platform developed primarily to host, manage, and analyse freshwater biodiversity data for South Africa. It serves as an essential resource for a broad community of stakeholders including researchers, conservation practitioners, policymakers, and environmental managers, all working toward better management and conservation of South Africa's highly threatened freshwater ecosystems. Over the last two years, the FBIS team have focused on platform enhancements, expansion of biodiversity modules and translating data in impact.

FBIS was designed to address the critical need for reliable, comprehensive, and accessible data on freshwater biodiversity, which has historically been fragmented and difficult to access. Freshwater systems in South Africa face numerous pressures such as over-abstraction of water, invasive species, land use change, pollution, and climate change—all contributing to rapid ecosystem degradation and loss of biodiversity. Given that many freshwater species, especially fish, are highly threatened, accessible data is vital for informed conservation and sustainable management.

The platform harmonizes and consolidates large datasets from multiple sources including scientific publications, research reports, databases like the Global Biodiversity Information Facility (GBIF), legacy South African databases, and field data contributed by users. It hosts over 800,000 biodiversity records covering diverse taxa such as fish, aquatic invertebrates, algae, anurans, and plants, along with associated abiotic data like physico-chemical parameters. The system offers a rich, visual interface with spatial layers, dashboards, and filters to facilitate the interrogation, visualization, and extraction of data tailored to various management and research needs.

One of FBIS's key features is its support for data-driven decision making. For example, it provides data to South Africa's Department of Forestry, Fisheries, and the Environment's National Environmental Screening Tool, which flags biologically sensitive areas during environmental impact assessments for developments. Freshwater fish sensitivity layers generated from FBIS data help protect critical habitats by informing regulatory processes. FBIS's data has

also been used to evaluate protected area effectiveness, guide conservation planning, and support national biodiversity assessments.

The FBIS includes a mobile application that streamlines field data collection by allowing users to upload monitoring data directly from sites, eliminating the need for paper datasheets. This app accommodates detailed ecological and environmental data, photographs, and notes, supporting real-time data capture and synchronization with the main platform. The system's architecture uses open-source software and adheres to international biodiversity data standards, including rich metadata preservation, making large datasets easily accessible with the click of a button. The platform also facilitates multi-user collaboration, access management, and expert validation of data, ensuring high data quality and usability.

In summary, the Freshwater Biodiversity Information System is a vital, cutting-edge tool for consolidating and democratizing freshwater biodiversity data across South Africa. It bridges data gaps, enables comprehensive monitoring of freshwater ecosystems, and empowers stakeholders to make well-informed, evidence-based decisions that promote the conservation and sustainable use of freshwater resources and species under threat.

This system not only supports scientific research and conservation efforts but directly influences policy, permitting processes, and environmental stewardship in a country where freshwater biodiversity is uniquely rich yet severely imperilled. Through its collaborative and integrative design, FBIS exemplifies how technology and data sharing can drive impactful conservation outcomes on a national scale.

Funders: JRS Biodiversity Foundation

Partners: Kartoza, South African National Biodiversity Institute, South African Environment and Observation Network, South African Institute for Aquatic Biodiversity, Department of Water and Sanitation, Endangered Wildlife Trust, CapeNature, SANParks, Association for Water and Rural Development, City of Cape Town, Water Research Commission.

Project Value: Since 2017: R 9,500,000, FBIS Phase 2: R 5,000,000



infraFADA - Upgrading the taxonomic backbone of global freshwater animal biodiversity research infrastructures

The FRC and Kartoza are working together on the infraFADA project to develop an online taxa information management system (FADAtims), which will allow the FADA (Freshwater Animal Diversity Assessment) experts to curate, maintain, and publish their taxa lists. These lists will be available to all potential users and interoperable with other (global) data infrastructures. This exciting global collaboration promises to greatly improve curation and access to taxonomic information for freshwater species. infraFADA joins as a tenant into the multi-tenant platform model that now underpins all FRC/Kartoza bioinformatics programmes.

Funders: University of Natural Resources and Life Sciences, Department of Water, Atmosphere, Environment, Institute of Hydrobiology and Aquatic Ecosystem Management (BOKU, Vienna, Austria)

Partners: Kartoza, Royal Belgian Institute of natural Sciences (RBINS, Brussels, Belgium)

Project Value: R 550,000

Developing a Freshwater Information Platform (FIP)

The FRC collaborated with Kartoza to develop phase 1 of the Freshwater Information Platform (FIP) for the IGB Leibniz Institute of Freshwater Ecology and Inland Fisheries and trained staff in data management and mobilisation. The FIP is a global platform for managing and viewing freshwater biodiversity data and is based on the FBIS. FIP will join as a tenant into the multi-tenant platform model that now underpins all FRC/Kartoza bioinformatics programmes. The FIP will expand as funds become available.

Funders: IGB Leibniz Institute of Freshwater Ecology and Inland Fisheries

Partners: Kartoza

Project Value: R 105,000

Developing a Biodiversity Information System for the South African National Parks

FRC and Kartoza are developing the Biodiversity Information System for South Africa's National Parks. It will serve as a platform for collating relevant data to inform conservation research, management and decision making for South Africa's National Parks. The FRC/Kartoza team are working closely with the SANParks Data Management team, who have been trained to manage and mobilise biodiversity data (freshwater, terrestrial and marine) for their parks. SANParks joins as a tenant into the multi-tenant platform model that now underpins all FRC/Kartoza bioinformatics programmes. To date the platform has more than 6.4 million records.

Funders: South African National Parks

Partners: Kartoza

Project Value: R 1,521,800

Development of the Kafue Flats Wetlands Information System (KFWIS)

Working closely with the team from the International Crane Foundation and the Endangered Wildlife Trust in Zambia, FRC and Kartoza are developing an open access, online platform, the KFWIS, for hosting, analysing, visualising and sharing freshwater biodiversity data for the Kafue Flats wetlands. The KFWIS joins as a tenant into the multi-tenant platform model that now underpins all FRC/Kartoza bioinformatics programmes. Training was provided for all Kafue staff on data management and mobilisation.

Funders: International Crane Foundation and the Endangered Wildlife Trust

Partners: Kartoza

Project Value: R 665,000

REFRESH: Renewing data and filling knowledge gaps for freshwater species of South Africa

FRC and partners are working to mobilise existing data, undertake field surveys, improve identification tools, strengthen collaboration amongst stakeholders in the freshwater biodiversity sector in South Africa, assess the threat status of selected freshwater taxa and make these data readily available.

Funders: South African Institute of Aquatic Biodiversity and South African National Biodiversity Institute with funding from the National Research Foundation FBIP Programme

Partners: South African Institute of Aquatic Biodiversity and South African National Biodiversity Institute, North-West University, Stellenbosch University, Rhodes University, South African National parks, Albany Museum.

Project Value: R 155,000



FBIS-Africa: A Freshwater Biodiversity Information System for Africa

Africa's freshwater ecosystems support a remarkable diversity of species and sustain the lives of millions of people across the continent. However, many of Africa's freshwater systems are degrading due to threats like habitat destruction, species over exploitation and climate change. This poses serious risk to biodiversity and ecosystem services. There is an urgent need for improved and strategic management, protection and restoration of Africa's freshwater ecosystems. This requires access to reliable, current, comprehensive data on freshwater biodiversity. Access to freshwater biodiversity data in Africa is however currently limited and existing platforms do not meet Africa's freshwater monitoring and management needs.

Rising to the challenge of these data and conservation challenges, and building on foundations laid by FBIS South Africa, the FRC and partners are developing a new freshwater biodiversity information system for Africa – FBIS Africa. The platform will improve access to freshwater biodiversity data across

Africa, provide powerful tools for analysing these data, and function as user-friendly African freshwater data repository. The overarching aim of the platform is to improve conservation and support sustainable utilization of Africa's freshwater ecosystems.

Funders: JRS Biodiversity Foundation

Partners: Kartoza, World Wide Fund for Nature, The Nature Conservancy, African Parks, National Geographic Okavango Wilderness Project, and The Wilderness Project, Conservation International, Re:wild and Shoal.

Project Value: R 8,750,000

Climate Change



Identification and Assessment of Hybrid Flood Alleviation Options in a Changing Climate

The Freshwater Research Centre was part of a multi-disciplinary team that received GIZ funding to undertake an assessment of hybrid solutions to flooding in three sub-catchments of the Berg River in the Drakenstein Municipality, in the town of Paarl. The aim was to find a blend of hard engineered (grey infrastructure) solutions and well-managed ecological (green) infrastructure, to improve the resilience of these catchments to flooding, especially in the urban area of Paarl.

FRC's input involved the identification and mapping of wetlands and rivers in the three catchments, assessments of their ecological condition, biodiversity importance and their ability to offer ecosystem services. Our headline findings were:

- A diversity of wetlands and river types were mapped in all three catchments
- A diversity of aquatic ecosystems supply a diversity of ecosystem services, with flood alleviation being among them
- Floodplain and valley-bottom wetlands are the “best in class” with regards to flood alleviation
- Healthy wetlands and rivers provide the most efficient ecosystem services
- Rehabilitation of aquatic ecosystems is essential to improve their service offerings.

The FRC team sat down with engineers and landscapers to design detailed implementation plans for Paarl, in consultation with affected communities. Six designs were planned and costed, two in each catchment, for implementation by the Municipality, as and when funds become available. In addition, conceptual rehabilitation recommendations were made for all of the rivers and wetlands within the Drakenstein Municipality.

Funders: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)

Partners: AIVIA

Project Value: R 181 720



Skills & Training

Biomonitoring Training

Three courses were run, one in 2024, and two in 2025. Fifteen individuals from a diverse organisation including the Nuwejaars Wetland SMA, Gouritz Cluster Biosphere Reserve, Cape Winelands Biosphere, Tshwane University of Technology, DEA&DP | Environmental Affairs and Development Planning and various consultants (Exigent Environmental, JG Afrika, Triplo4, Ecological Nexus, Rio Tinto – Guinea) received training in April 2024. SASS is the cornerstone of river monitoring and is widely used by river practitioners in South Africa to assess the health of our rivers. The course involves a combination of theoretical and practical training on SASS and the identification of aquatic macroinvertebrates.

In January 2025, a team of ten scientists, from The Wilderness Project were trained in SASS and other African rapid bioassessment protocols. This bespoke training equipped the team to conduct river health assessments in numerous countries including Botswana, Angola, Tanzania and Zambia.

In April 2025, 15 participants from a range of organisations were trained, including Grootvadersbosch Conservancy, Emanti, Breede-Gouritz Catchment Management Agency, FEN Consulting, Southern Waters, UNISA, Tshwane University of Technology, Ecofarms, Steffani Marine Environmental Consulting and Umvoto Africa.

To date FRC have trained 121 individuals in SASS bioassessment.





Education & Outreach

Living Labs

Founded in 2017, Living Labs is the Freshwater Research Centre's River education and outreach programme. It centres around connecting schools and other community groups to nearby rivers for an immersive nature experience, at the same time collecting meaningful ecological data. Rivers are ideal outdoor classrooms for learning about biodiversity, ecology and conservation, and the activities covered during the Living Labs experience are designed to complement what is learned in Life Sciences at schools. Under the guidance of passionate freshwater biologists, the groups conduct their own 'miniSASS' assessment - a biomonitoring tool to estimate the health of the river.

This hands-on, wet feet, "real science" experience allows learners to relax in nature and connect with their local river environment - often for the very first time. Besides the palpable excitement that an encounter with a larval dragonfly generates, the river health assessment also produces meaningful data about the state of the river ecosystem. The results are uploaded to a national database and thereby made available to scientists and freshwater decision makers.

Living Labs also offers miniSASS training, equipment and ongoing support for school teachers and community leaders, thereby striving to grow a strategic network, each connected to a river which they learn from and help conserve.

A highlight over this period has been partnering with Youth 4 Conservation (Y4C), an NPO that creates meaningful conservation experiences for youth while ensuring tangible impacts on the ground. Together, we offer diverse freshwater conservation experiences including multi-day Saving Sandfish and Bainskloof camps and the River2Sea programme, all designed to connect young people to nature through immersive, hands-on learning experiences in South Africa's precious freshwater environments.

Activities 2024–2025

4–5 March 2023: Two-day Bainskloof camp with the American International School of Cape Town.

6 and 8 March 2023: Cedar House grade 10 Life sciences outings to the Liesbeek River

25 September 2024: Masiphumelele Secondary School River2Sea programme – Full day outing on the Silvermine River and a visit to the Clovelly wetlands. Funded by FNB Care.

15–17 November 2024: Three-day Saving Sandfish camp with the American International School of Cape Town.

19 November 2024: Noordhoek Environmental Action Group and Call of the Wild school MiniSASS assessments of the rivers of the Noordhoek common

5–7 December 2024: Three-day Saving Sandfish camp with Cedar House

7–9 December 2024: Three-day Saving Sandfish camp with St Cyprians.

Total number of youth engaged: 220

Funders: FNB Care

Partners: Youth4Conservation

Project Value: R 180, 000





Publications 2024–2025

Scientific Papers

Cerrilla C, Flemming L, Griffiths CL, Impson D, Jordaan MS, Kajee M, Paxton BR, van der Walt JA, Whitehead TO and Shelton JM. 2023. Using a head-start conservation intervention to boost spawning numbers of the endangered Clanwilliam sandfish. *Conservation Science and Practice*. Volume 6. Issue 1. <https://doi.org/10.1111/csp2.13065>

Dallas H and Shelton J. 2024. Biodiversity data at your fingertips: The Freshwater Biodiversity Information System. *South African Journal of Science*, 120(7/8). <https://doi.org/10.17159/sajs.2024/18705>

Kajee M, Dallas HF, Griffiths CL, Kleynhans CJ and Shelton JM. 2023. The Status of South Africa's Freshwater Fish Fauna: A Spatial Analysis of Diversity, Threat, Invasion, and Protection. *Fishes* 8 (12): 571. <https://doi.org/10.3390/fishes8120571>.

Kajee M, Dallas HF, Swanepoel A, Griffiths CL and Shelton JM. 2023. The Freshwater Biodiversity Information System (FBIS) fish data: a georeferenced dataset of freshwater fishes occurring in South Africa. *Journal of Limnology*.

Kajee M, Henry DA, Dallas H, Griffiths CL, Pegg J, Van Der Colff D, Impson D, Chakona A, Raimondo DC, Job N, Paxton B, Jordaan MS, Bills R, Roux F, Zengeya TA, Hoffman A, Rivers-Moore N and Shelton JM. 2023. How the Freshwater Biodiversity Information System (FBIS) is supporting national freshwater fish conservation decisions in South Africa. *Frontiers in Environmental Science*. 11. DOI: 10.3389/fenvs.2023.1122223/abstract.

Odume ON, Akamagwuna FC, Ntloko P, Dallas HF, Nhadozie CF and Barber-James HM. 2023. A trait database for southern African freshwater invertebrates. *African Journal of Aquatic Science*: DOI: 0.2989/16085914.2022.2142505.

Pfananani Ramulifho, Nick Rivers-Moore and Stefan Foord. 2023. "Relationships between reference site quality and baetid mayfly assemblages in mountainous streams of the Luvuvhu catchment, South Africa", *Water SA*, 49(3 July). doi:10.17159/wsa/2023.v49.i3.4023.

Ramulifho P, Foord S and Rivers-Moore N. 2024. Space and spatially structured environmental variables account for variation in blackfly and mayfly communities in sub-tropical South African rivers. *African Journal of Aquatic Science*, 49(3), 223–231. <https://doi.org/10.2989/16085914.2024.2381454>

Rivers-Moore NA. 2024. Temperature thresholds to guide choice of freshwater species for monitoring onset of chronic thermal stress impacts in rivers. *Transactions of the Royal Society of South Africa*, 79(1), 101–110. <https://doi.org/10.1080/0035919X.2024.2329920>

Yates AG, Brua, RB Culp JM, Dallas HF et al. 2025. Charting a course for freshwater biomonitoring: The grand challenges identified by the global scientific community. *Ecological Indicators*, 176 doi.org/10.1016/j.ecolind.2025.113646.

Reports

Cerrilla C, Impson D, van der Walt R and Shelton J. 2025. Biedouw River Restoration Project: Progress Report. July 2025. Freshwater Research Centre, p.33.

Gwapedza D, Barreteau O, Mantel S, Paxton BR, Tholanah R, Xoxo S, Theron S, Mabohlo S, O'Keeffe L, Bradshaw K and Tanner J. 2024. Engaging stakeholders to address a complex water resource management issue in the Western Cape, South Africa. *Journal of Hydrology*, 639. p. 131522.

Howard G and Pollard S. 2025. RDM Breede- Gouritz. An analysis of potential sites for Flow Compliance Monitoring within the lower Breede, Gouritz and coastal catchments. JRS/ Green Trust Internal report.

Mantel S, Mabohlo S, Theron S, Xoxo S, Paxton BR, Barreteau O, Tholanah R, Bradshaw K, Bonte B and Tanner J. 2024. A Stakeholder Driven Process to Develop a more Equitable and Sustainable Water Resource Management Plan. Water Research Commission. Pretoria. WRC Report No. 3157/1/24. p. 101.

Paxton BR. 2024. Source-2-Sea: Balancing Water, Agriculture, and Ecology in the Olifants-Doring and Sandveld Catchments. Situation Assessment. Prepared on behalf of WWF-SA by the Freshwater Research Centre. p. 148.

Paxton BR, Cogill L, Huchzermeyer B, Huchzermeyer P, Kotze D, Ollis D, Rebelo A, Skosana T, Van der Waal B, and Du Plessis C. 2025. Source-2-Sea: Balancing Water, Agriculture, and Ecology in the Olifants-Doring and Sandveld Catchments Ecological Infrastructure Strategic Plan. Prepared on behalf of the Embassy of the Netherlands by the Freshwater Research Centre. Cape Town. p. 105.

Paxton BR, Howard G, Wijninckx J and Greyling A. 2025. Development and Application of the Water Balance Tool in the Twee River Catchment, Koue Bokkeveld, South Africa. Freshwater Research Centre. Cape Town. p. 43.

Pollard S. 2025. Overview of current institutional arrangements for Resource Directed Measures within the BOCMA and DWS Western Cape. Green Trust Internal report.

Pollard S and Howard G. 2025. Draft methodology to undertake real-time Flow Compliance Monitoring. JRS/ Green Trust Internal report.

Pollard S and Snaddon K. 2025. Ecological Infrastructure Management Plan (EIMP): Quaternary Catchments H10F and H10G. (Upper Breede River Catchment). Final Report to Breede Olifants Catchment Management Agency. Included policy review, spatial datasets and resources.

Pollard S and Snaddon K. 2025. Guidelines for the development of a Water-Related Ecological Infrastructure Management Plan (EIMP). Report to Breede Olifants Catchment Management Agency.

Rivers-Moore N and Paxton BR. 2024. Aquatic and Terrestrial Conservation Values Mapping for Southeast Angola. Technical Report. Prepared for WWF by the Freshwater Research Centre. 58 pp.

Snaddon K, Shelton J, Cerrilla C and Paxton B. 2024. Baseline monitoring of freshwater biodiversity responses to invasive alien plant removal in catchments surrounding Theewaterskloof Dam. Prepared for The Nature Conservancy by the Freshwater Research Centre, 72 pp.

Snaddon K and Pollard S. 2024. Development of a Hybrid Flood Alleviation Programme for three Drakenstein Catchments: Freshwater Ecological Assessment Report. Report submitted to AIVIA, for the Drakenstein Municipality, August 2024, 74 pp.

Snaddon K and Pollard S. 2025. Development of a Hybrid Flood Alleviation Programme for three Drakenstein Catchments: Freshwater Ecological Assessment Report. AVIA.

Snaddon K and Pretorius L. 2025. Reimagining Wetland Delineation. A collaborative re-write of the Guidelines for improved wetland protection and water security: Delineation guideline Framework. Report submitted to Water Research Commission, December 2025, 19 pp.

Snaddon K, Pretorius L, van Tol J and Ramdhani B. 2025. Reimagining Wetland Delineation. A collaborative re-write of the Guidelines for improved wetland protection and water security: Inception Report. Report submitted to Water Research Commission, February 2025, 46 pp.

Snaddon K, Shelton J, Cerrilla C and Calder J. 2025. Monitoring of freshwater biodiversity responses to invasive alien plant removal in catchments surrounding Theewaterskloof Dam. Prepared for The Nature Conservancy by the Freshwater Research Centre. 83 pp.

Snaddon K, Shelton J, Day J and Cerrilla C. 2025. Ecological assessment of HBD ponds as habitat for aquatic fauna and flora. Report submitted to HBD, August 2025, 31 pp.

Xoxo S, Tanner J, Mantel S, Gwapedza D, Paxton B, Hughes D and Barreteau O. 2024. Equity-Based Allocation Criteria for Water Deficit Periods: A Case Study in South Africa. In: Liu S, Zarate P, Kamissoko D, Linden I and Papathanasiou J. Decision Support Systems XIII. Decision Support Systems in An Uncertain World: The Contribution of Digital Twins, 2023// 2023 Cham. Springer Nature Switzerland, 137-155.

Popular articles

FBIS – helping to collate quality data for the preservation of SA's freshwater biodiversity (The Water Wheel March/April 2024)

How I'm protecting Clanwilliam sandfish. Cecilia Cerrilla's PhD project is to protect a tiny species of fish from predatory bass.

How the great sandfish rescue is saving one of SA's most endangered freshwater fish (News24/April 2024)

Films

FBIS Mobile App

The Life of a Data Point

Saving sandfish | EP5 | Onderbek se Kind

Saving Sandfish | EP6 | Koning vannie Doring

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HBD South Africa
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Mary Oppenheimer & Daughters Fund Grant Agreement
Mohammed Bin Zayed Species Conservation Fund
National Geographic
Resilient Cities Catalyst
ReWild: Fonseca Species Conservation Fund
South Africa National Parks
Table Mountain Fund
The Rufford Foundation
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The University of Botswana
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Water Research Commission of SA
World Wide Fund for Nature – South Africa
World Wide Fund for Nature – Zambia
World Wide Fund for Nature – Green Trust

Key Partners

Association for Water and Rural Development
CapeNature
Department of Agriculture Western Cape, Landcare Programme
Department of Water and Sanitation
Department of Environment and Development Planning
Grootvadersbosch Conservancy Trust
Institute for Water Research – Rhodes University
Kartoza
Phuhlisani NPO
Rhodes University, Institute for Water Research
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Financials 2024–2025

Statement of Financial Position

Figures in Rand	2025	2024	2023
Assets			
Non-Current Assets			
Property, plant and equipment	38 376	59 812	42,492
Current Assets			
Trade and other receivables	118 926	8 600	9,718
Cash and cash equivalents	5 975 966	4 814 727	4,807,417
	6 094 892	4 823 327	4,817,135
Total Assets	6 133 268	4 883 139	4,859,627
Capital and Liabilities			
Capital			
Retained income	1 611 908	1 330 677	1,045,239
Liabilities			
Current Liabilities			
Trade and other payables	4 521 360	3 552 462	3,814,388
Total Equity and Liabilities	6 133 268	4 883 139	4,859,627

Statement of Comprehensive Income

Figures in Rand	2025	2024	2023
Revenue	7 340 948	6 067 270	6,041,256
Other income	195 447	423 552	436,576
Grant Funding Expenses – Consulting fees	(5 450 215)	(4 379 388)	(3,778,358)
Grant Funding Expenses – Other	(497 186)	(963 498)	(963,498)
Grant prepaid income	(815 927)	340 447	(685,602)
Operating expenses	(855 136)	(886 607)	(860,196)
Investment revenue	363 292	257 659	121,321
Surplus for the year	281,222	285,439	311,499
Other comprehensive income	–	–	–
Total comprehensive income for the year	281 222	285 439	311,499

Detailed Income Statement

Figures in Rand

	2025	2024	2023
Revenue			
Grant funding income	7,340,948	6,067,270	6,041,256
Grant funding expenses - consulting fees	(5,450,216)	(4,379,388)	(3,778,358)
Grant funding expenses - Other	(497,186)	(1,537,493)	(963,498)
Grant prepaid income	(815,927)	340,447	(685,602)
Grant administration fees	577,619	490,836	613,798
Training and Education			
SASS training income	259,631	195,678	161,948
SASS training expenses	(259,631)	(195,678)	(161,948)
Living Labs training income	10,439	–	–
Living Labs training expenses	(10,439)	–	–
Gross profit	577,619	490,836	613,798
Freshwater Research Centre NPC Income			
Donations	8,115	6 775	257,440
Salaries Reimbursed	53,450	54,785	37,300
Gains on disposal of assets	–	2,431	35,999
Equipment and vehicle rental income	112,102	79,964	86,002
Other rental income	21,780	18,598	19,835
Saving Sandfish / Fish Revival donation income	477,069	330,696	190,300
Saving Sandfish / Fish Revival donation expense	(477,069)	(330,696)	(190,300)
	195,447	162,553	436,576
Expenses	(855,136)	(625,607)	(860,196)
Operating (deficit) surplus	(82,070)	27,782	190,178
Investment income	363,292	257,659	121,321
(Deficit) Surplus for the year	281,222	285,441	311,499