FYNBOS FORUM

2025 ABSTRACT BOOK

FUTURE-PROOFING FYNBOS

Fynbos Forum Conference 2025

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Protecting and restoring South Africa's natural heritage for the benefit of all: Establishing Biodiversity Gardens Across the Western Cape

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Funded by the National Lotteries Commission, this project supports the development and coordination of 15 biodiversity gardens across the Western Cape, structured into two primary groups. The first, the Kirstenbosch group, focuses on establishing gardens within the Cape Town region. The second, known as the greater Western Cape group, concentrates on five gardens linked to the Botanical Society of South Africa (BotSoc) branch regions: Darling (Weskus), Elim (Southern Overberg), Kleinmond (Kogelberg), Worcester (Cape Winelands), and George (Garden Route). These gardens serve as dynamic, living classrooms aimed at fostering environmental education, community engagement, and the conservation of indigenous flora. Each site features locally appropriate, site-specific plant species that reflect and celebrate the unique biodiversity of the surrounding landscape-strengthening the connection between people and nature.
A key component of the project was the capacitation of 15 youth, placed in teams of three across the five garden sites. These conservation youth candidates received hands-on training in ecological restoration and horticultural practices through partnerships with local biodiversity organizations: Vula Environmental Services (Darling), SANBI's Harold Porter National Botanical Garden (Kleinmond), SANBI's Karoo Desert National Botanical Garden (Worcester), Nuwejaars Wetland Special Management Area (Elim), and the Garden Route Botanical Garden (George).
Beyond enhancing ecological literacy, this project offers a replicable and sustainable model for integrating biodiversity conservation into both urban and rural communities through youth development, collaboration, and long-term stewardship.

The Economics of Honeybush Cultivation in South Africa and its Potential for Small Scale Agricultural Development

Melissa Amos

Rhodes University, Makhanda

Abstract

An ongoing challenge in environmental economics is the sustainable use of natural resources with open-access characteristics. Particularly in South Africa, this is an important consideration for sustainable and equitable development. Honeybush is one of these important resources and although it is harvested predominantly in the wild, there has been an introduction of cultivation for ensuring sustainability in the long run. This research aims to explore the economics of Honeybush tea production in South Africa, and its potential for small-scale agricultural development. This research makes use of primary survey data gathered from honeybush tea producers in South Africa forming the basis for case studies that examine the determinants and costs of production under varying operational conditions. Therefore, this research takes a case study approach to analyse three scales of honeybush production (small, medium and large).

Honeybush, Small scale agriculture, economics

mel.amos81@gmail.com

Economising our Heritage

Julia Prema

The Griekwa people were amongst the first people to settle in Plettenberg Bay in a little village then called Erikaville in the Crags, known today as Kurland village. They are descendants of the Khoisan and the French Huguenots. Through the generations, they have remained connected to the land and are familiar with indigenous plants of the landscape. They are aware of their medicinal uses and have used them for generations. It was a natural inclination to bring their natural world into their farming practices. Creating products from the community, for the community, they have come up with a basket of products to offer those directly surrounding them. Cultivating indigenous Fynbos species, harvesting them and turning them into finished products, has brought another dimension to their ancestral heritage. Their efforts have inspired hope and their sustainable micro- enterprises look promising for the future!

A Biodiversity Management Plan for the Tradouw redfin and what this means for incentivising the protection of freshwater ecosystems in the fynbos biome

Aileen Anderson & Dr Martine Jordaan

Grootvadersbosch Conservancy

The Cape Fold Ecoregion is a hotspot for endemic and range-restricted freshwater fish. One such example is the Tradouw redfin Pseudobarbus burchelli a unique lineage found only in the Tradouw/Huis Catchment. The species was listed as Critically Endangered during the most recent IUCN Red List Assessment for all freshwater fishes of South Africa (Chakona et al., 2022). The populations face threats such as low water flows, poor water quality and invasion by alien fish species. Invasive banded tilapia, bluegill sunfish and largemouth bass are present and established in large sections of the distribution range of the redfin (Jordaan et al., 2024). To support the conservation of this species and the associated freshwater habitat, a species action plan has been developed which will become a Biodiversity Management Plan. The publication of a BMP, and the signing of a Biodiversity Management Agreement between taxpayers and the Minister of Environment has the potential to unlock a tax incentive for qualifying taxpayers. The tax incentive allows for a deduction of qualifying conservation and maintenance expenses from the taxable income of eligible taxpayers, effectively reducing tax payable and incentivising conservation efforts. If successfully, applied this presents the first time that such an instrument would be applied in the Western Cape and a first for application in the freshwater environment. The presentation will provide an overview of the work done to date in the system, an overview and status of the BMP and lessons learned on how this instrument can be used in other contexts.
Freshwater conservation, Tax incentives, critically endangered species

Wood anatomy of Lobostemon (Boraginaceae): implications for the functions of living fiber-tracheids and narrow vessel elements.

Azwinndini Matshinga and Alexei Oskolski

Department of Botany and Plant Biotechnology
University of Johannesburg

Lobostemon Lehm. (Boraginaceae) comprises 28 shrubby species endemic to the Greater Cape Floristic Region, predominantly occurring in fynbos, with some extending into the succulent karoo. This genus represents an example of secondary woodiness, having evolved a shrubby habit from herbaceous ancestors. This study examines the wood anatomy of mature stems in eleven Lobostemon species, with a focus on the functional and adaptive significance of two notable xylem traits: (1) living fiber-tracheids with persistent protoplasts, and (2) vessel dimorphism characterized by the co-occurrence of relatively wide vessels (>15 µm diameter) and distinctly narrower ones (<10 µm).

Living fiber-tracheids, not involved in the ascent of xylem sap, likely contribute to mechanical support and the storage of water and non-structural carbohydrates, especially in light of the low abundance of axial parenchyma. A positive correlation between bordered pit size on fiber-tracheid walls and ray frequency suggests a role in hydraulic capacitance, potentially enhancing drought resilience through the release of water stored in living protoplasts.
Both xylem traits are positively correlated with plant height, which is inversely related to precipitation during the driest season. This implies that taller plants in drier habitats may require greater stem storage capacity. These findings support the hypothesis that Lobostemon adopts a drought avoidance rather than tolerance strategy.

The grouping of wide vessels is associated with increased temperature seasonality, lower annual precipitation, and drier winters, suggesting their role in seasonal drought tolerance by providing alternative conductive pathways around embolized vessels. In contrast, the grouping of narrow vessels correlates positively with humidity and water availability, indicating their likely role in lateral water transfer between wide vessels and living fiber-tracheids, facilitating water release into the xylem sap.

Overall, this study positions Lobostemon as a valuable model for understanding structural wood adaptations to the challenges of a Mediterranean-type climate."
Lobostemon, Living fiber-tracheids, Fibriform vessel elements,Wood Anatomy, Drought adaptation.

Protecting And Restoring South Africa's Natural Heritage Biodiversity Conservation Gardens in Schools and Communities in the Cape Flats

Ngawethu Ngaka[1], Tevin Adams, Yondela Nqadala, Sinazo Jama, and Martina Treurnicht

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Abstract

The Cape Flats is a biodiversity-rich yet ecologically degraded region, where urban expansion and environmental neglect have led to the loss of much of the original Cape Flats Sand Fynbos and Cape Flats Dune Strandveld vegetation. As part of efforts to protect and restore South Africa's natural heritage, the Botanical Society of South Africa (BotSoc) initiated school-based and community garden projects in under-resourced urban areas. This poster presents two conservation sites: Spineview Primary School and SOS Children's Village in Cape Town. At each site, biodiversity conservation gardens were designed and implemented (in June-July 2025) with a group of youth trainees using locally indigenous fynbos species to create themed planting beds focused on pollinator support, medicinal use, and habitat restoration. The gardens serve dual functions, conserving local biodiversity and acting as living classrooms to promote environmental education among youth and learners. The Youth, community and learner participation were central to the planting process, reinforcing conservation messaging and practical skills. Early outcomes include increased awareness of indigenous plants and improved site aesthetics. These interventions demonstrate how local partnerships, ecological horticulture, and environmental learning can act as vibrant hubs for community and youth engagement, enhancing the value of our fynbos heritage in urban settings while inspiring a new generation of conservation custodians. The approach offers a replicable approach to biodiversity conservation in other areas, to restore and protect our biodiversity. Keywords: Indigenous, fynbos, biodiversity, conservation, education

Restoring and Protecting South African Heritage

Yondela Nqadala
Botanical Society of South Africa

ABSTRACT:
Proudly funded by the NLC, our project has made significant strides in Fynbos conservation and community empowerment. We've planted over 74 indigenous Fynbos plant species in biodiversity gardens, including those of conservation concern and ethnobotanical importance. Simultaneously, the initiative has equipped local youth with essential conservation, horticulture, and ecological restoration skills, addressing a critical sector skills gap. Furthermore, beneficiaries have greatly contributed to Fynbos knowledge through citizen science efforts like the City Nature Challenge, enhancing our understanding of species distribution and fostering scientific engagement within the community.

Poster

Passive restoration of fynbos after afforestation with exotic pines

Johan Baard

SANParks, Garden Route National Park

Abstract

Plantations, and associated invasions, of exotic Pinus trees occur extensively in the southern hemisphere, threatening the persistence of biodiverse Mediterranean-climate vegetation. Large-scale decommissioning of such plantations in the eastern Cape Floristic Region (South Africa) enabled a wide-ranging study showing successful passive restoration of fynbos vegetation after afforestation. Using a paired study design, we compared the diversity, and floristic and growth-form composition of post-fire recovering fynbos in former plantations with that in recently burnt neighbouring fynbos in a natural state within the Garden Route National Park. The fynbos of the study area showed good autogenic recovery after several decades of pine afforestation and a fire subsequent to the clearcutting of these trees. On average, native plant abundance and species richness (particularly of shrubs) were significantly lower, and non-native plant species richness significantly higher, in former plantation areas than in natural fynbos, but these differences were small. Species diversity did not differ significantly between the two vegetation states. The former plantations harboured 91% of the number of native species that the natural fynbos had, while the similarity of the two floras was 65%. Non-metric multidimensional scaling ordination and multivariate generalized linear models accordingly showed no clear distinction in community composition between the two vegetation states. We concluded that the restoration potential of the montane grassy fynbos in the study area is superior to that previously documented in montane proteoid fynbos, and that fire and invasive alien plant control after clearcutting of the plantations is essential to promote fynbos restoration. autogenic recovery,

Cape Floristic Region, fynbos diversity, invasive alien plants, Pinus pinaster, Pinus radiata, plantation clearcutting

Future-Proofing Fynbos through Strategic Offset Approaches

Frances Balayer, Marlene Laros
Western Cape Department of Environmental Affairs and Development Planning, 1 Dorp Street, Cape Town, 8000

Abstract

The Western Cape's globally significant fynbos ecosystems face mounting pressure from development. To reconcile economic development with conservation, the Western Cape Government has initiated strategic offset approaches such as the Saldanha Strategic Offset Strategy (SSOS), a pioneering landscape-level approach to biodiversity conservation. A follow-up project proposes the establishment of an SSOS Biodiversity Offset Credit Scheme, designed to streamline and scale conservation efforts while enabling sustainable development.

The project addresses the challenge of fragmented, ad-hoc biodiversity offsets by creating a revolving fund – potentially hosted by a public development bank or financial institution – to proactively secure and manage like-for-like conservation-worthy land. Developers who require offsets will then be able to fulfil their obligation by purchasing biodiversity offset credits generated by this pre-secured land, with the income from credits sales then funding the ongoing expansion of conservation areas containing the affected ecosystem types and further generation of credits.

This initiative is a practical, policy-aligned intervention grounded in systematic conservation planning, ecological science, spatial planning, and financial innovation. It anticipates reduced administrative burdens and "de-risking"" for developers and investors while ensuring legal requirements to reduce environmental impact are met, combined with improved conservation outcomes and resilience of fynbos ecosystems. As a next step the project also explores broader applications, including an offset bank for public developments as well as an overarching province-wide biodiversity credit framework aligned with global targets such as 30x30.
By embedding biodiversity into the economic fabric of the region, the strategic offsetting approach offers a replicable model for future-proofing fynbos landscapes. It demonstrates how strategic planning, institutional collaboration, and innovative finance could unlock development while safeguarding irreplaceable natural heritage.

Celebrating 20 years of Fynbos Conservation in the Winelands

Carina Becker du Toit
WWF - SA

Abstract

WWF Conservation Champions (CC) farms embrace Regenerative Agriculture or biological farming principles of nature-positive production at scale and strive to be water and energy conscious. The programme assists champion farms to protect nature, manage agriculture in ways that enhance the richness of biodiversity and restore the functionality of degraded agroecosystems. The programme is celebrating 20 years of conservation in the wine industry, and to date 60 farms are active champions, where roughly 25 000 ha of natural land within the CFR is conserved and the rest of the farm's agricultural land is under better management. This will be celebrated in the launch of our new CC video. Collaboration is key in conservation. With assistance from Nedbank Green Trust, WWF produced the Farming with biodiversity book. This farmer friendly book show cases 10 farms who taken initiative to change farming practises. This book encourages farmers to view their farm through a biodiversity lens and to incorporate nature into farming areas.
CC has a long standing relationship with TMF, who is supporting our work on wine farms and providing incentive funding for farms to carry out environmental projects ranging from rehabilitation, alien clearing, creation of fire breaks, eco-tourism activities, environmental education, and others. The projects undertaken, as well as changes in farming practices, directly speak to the theme of protecting fynbos from farming impacts and promoting fynbos ecosystems. This talk showcases the amazing work from farming with biodiversity book, as well projects undertaken by some of our champions with support of funding from TMF"

agriculture, conservation, WWF, TMF

Linking Fynbos Landscapes

Rhian Berning and Brian Reeves
Eden to Addo Corridor Initiative, Finest Kind Farm, Wittedrift Rd, Plettenberg Bay

Abstract

South Africa's biodiversity and the integrity of our ecosystems are facing mounting challenges as multiple ecological thresholds are being exceeded due to rampant alien invasive species, habitat fragmentation and degradation, and unsustainable human activities. This we know. So, this Eden to Addo presentation delves into the pivotal role ecological corridors, connectivity and stewardship can play in facilitating biodiversity protection and bolstering ecosystem resilience in the Cape Floristic Region. Explore the central concepts of living corridors as linkages for species movement, genetic exchange, ecological processes (such as pollination and seed dispersal) and ecosystem functionality. Drawing upon interdisciplinary insights from our engagement with farmers, landowners and biodiversity stewards as well as from best practice land management plans and ecology research, we look at how strategic and well managed corridors can mitigate the impacts of habitat fragmentation, facilitating the movement of species across previously disjointed landscapes, enabling the flow of life again. We also look at the role of ecological corridors in enhancing ecosystem resilience to environmental stressors such as climate change and human-induced disturbance. Landscape connectivity and corridors enable species to adapt and migrate in response to changing environmental conditions, thereby strengthening the living system's capacity to withstand both present and future challenges. We present ways in which living corridors can be linked to sustainable livelihoods and healthy communities through wise land-use practices, ecosystem restoration, ecotourism and micro enterprises and how we as humans can be agents of change and custodians of life. This presentation is a clarion call for the urgent need for collaborative conservation efforts and collective interventions to establish and restore ecological corridors in our interconnected habitats and biomes, for the benefit of biodiversity, ecosystem resilience and healthy human communities. Ultimately for the benefit of all life.

Connectivity, Corridors, Ecosystem integrity, Sustainable Livelihoods, Biodiversity Stewardship

Casabio Citizen Science in Action

Dale Botha and David Gwynne-Evans
Casabio.org; 4 Wynand Rd, Lakeside, 7945

Abstract

Casabio brings a slew of new capabilities since the last Fynbos Forum. We now have a freshly plucked posie of compelling reasons to adopt Casabio for both your casual observations, and your research observations. We now have
- over 10 000 well-identified species available through our books portal.
- over 100 000 etymologies not only for plants, but animals too.
- descriptions for over 25 000 Southern African plant species.
- a GIS system that includes the vegetation map for South Africa
- a customisable labeling system for your herbarium or museum specimens
- a means to identify a number of species and their interactions from one image or a means to specify the multiple localities for a single species.

With collections, your specimens from plots, jars or traps can now be aggregated. With stories, your favourite observations can be shared with friends and a chosen fraternity on a social media platform of your choice.

Most of this, and more, are presented by Casabio representative, Dale Botha."
citizen science, etymologies, descriptions, images

Sex-Specific Nutritional Traits of Thamnochortus spicigerus Shape Eland Foraging Patterns in Strandveld

Petro Botha & Bruce Anderson

1. Department of Botany and Zoology, Stellenbosch University, Stellenbosch, South Africa.
2. Nature Connect, Tokai, South Africa

Abstract

While the role of large herbivores in the Fynbos Biome remains controversial, they are increasingly introduced into these ecosystems despite limited understanding of their dietary needs and ecological impacts. This study examines the feeding behaviour of eland (Taurotragus oryx) introduced into Cape Flats Dune Strandveld, with a focus on their interaction with Thamnochortus spicigerus (Restionaceae), a dominant restio species. Over a three-year period, eland feeding activity was monitored, alongside seasonal measurements of plant height and inflorescence presence in male and female plants, both exposed and unexposed to herbivory. Laboratory analyses assessed protein, moisture, fibre, and dry matter content of plant samples collected during autumn and spring. Eland feeding on T. spicigerus was largely restricted to autumn. Notably, only male plants exhibited signs of herbivory; female plants remained untouched, regardless of season. In autumn, restios, particularly males, had higher moisture and lower protein, fibre, and dry matter content compared to spring, possibly explaining the observed male-biased browsing.
These findings suggest that plant sex and seasonal nutrient variation influence eland foraging behaviour. As large herbivores become more common in Fynbos landscapes, understanding such interactions is vital for future-proofing these ecosystems. Selective herbivory could shift plant community dynamics, particularly if herbivores target specific sexes of dominant species. Anticipating such trophic interactions will be critical in managing the long-term resilience of Fynbos vegetation under increasing pressures from land-use change, species introductions, and climate variability.

Cape Flats Dune Strandveld, megaherbivore,Tragelaphus oryx.

Building a community of restoration practitioners

Corne Brink, Jessi Venter, Aileen Anderson
Grootvadersbosch Conservancy

Abstract

This workshop reflects on the outcomes and lessons learned from the Grootvadersbosch Conservancy Trust's (GVBCT) 2024 peer-to-peer exchange, which brought together 17 restoration practitioners to share experiences and insights in ecological restoration. Held as part of an IKI Small Grants project, the event focused on knowledge exchange, collaborative problem-solving, and strengthening partnerships in the restoration of riparian, forest, and fynbos ecosystems. A key outcome of the exchange was the signing of a Memorandum of Understanding (MOU) among participants, laying the foundation for a formal network aimed at professionalising ecological restoration and rehabilitation. This workshop will build on that momentum, providing a platform to expand the initiative and invite broader participation and support. Facilitated by GVBCT, with contributions from leading organisations involved in the initiative, the session will offer insights into the process of community building among practitioners, share practical strategies for collaboration, and explore next steps in establishing a unified and professional restoration community.

restoration, knowledge exchange, partnerships, practitioners

Fynbos and renosterveld communities' responses to experimentally altered rainfall

Maryam Burger, Supervisors: Res Altwegg, Adam G. West, Colleen Seymour, Justin van Blerk

University of Cape Town, UCT, Rondebosch, 7700

Abstract

I used state-space models to analyse data from a long-term field experiment that tested vegetation responses to altered rainfall seasonality after fire in a Mediterranean-type ecosystem. State-space models are powerful and flexible tools for analysing time-series data and can separate variability due to observer error from ecological sources of variation. Experimental field manipulation studies provide the strongest inference of causal relationships needed to predict the effects of future climate change. I analysed data collected between 2016 to 2019 during seasonal vegetation surveys of 24 experimental plots of fynbos and renosterveld communities at a nature reserve in the Western Cape. After initial burning of all plots, experimental treatments consisted of summer irrigation and winter rainfall exclusion, effectively inverting the winter rainfall regime experienced by control plots, which received natural rainfall. Models tested the effect of treatment and season and their interaction on growth rates of population size and plot volume over time. Results were compared between renosterveld and fynbos sites and species that have different post-fire regeneration strategies. I found large positive effects of irrigation on average growth rates during the first summer after fire, which manifested through reduced mortality and faster proportional growth in volume. Effects were consistently greater in reseeding species and in the renosterveld populations. There is some evidence of slower growth during the second post-fire winter, especially in treatment plots, suggesting some sensitivity to winter rainfall exclusion. This work demonstrates the utility of state-space models in gaining deeper insights into complex ecological time-series data.

rainfall, seasonality, fire, experiment

Bridging the Gap: Aligning Research and Practice in the Cape Floristic Region

Hendri Coetzee, Sarah Hulley
Sarah Hulley Nature's Valley Trust

Abstract

The Cape Floristic Region Partnership (CFRP) Research and Practice Gap Working Group was established to address the persistent disconnect between scientific research and on-the-ground conservation practice. This presentation will introduce a strategic initiative aimed at closing this gap through a collaborative, spatially-informed approach.
We will present the development of a mapping tool designed to visualize the distribution of researchers and practitioners across the Cape Floristic Region, including areas beyond fynbos such as the Succulent Karoo. This tool, developed in collaboration with Nelson Mandela University, utilizes Google Forms and R-based visualization to support data-driven collaboration and will be hosted on the CFRP website.

The presentation will also outline the group's broader objectives, including:
- Facilitating collaboration between researchers and practitioners by aligning timelines and drivers.
- Identifying and sharing research gaps and opportunities.
- Promoting co-supervision and mentorship across institutions.
- Connecting researchers with funding opportunities.
- Showcasing best practices in integrating science and practice through accessible communication.

We will share insights from a forthcoming survey designed to gather data on research topics, locations, and practitioner needs, and invite feedback from the Fynbos Forum community. This initiative is a step toward a more integrated, responsive, and impactful conservation research landscape in the Greater Cape Floristic Region.

Cape Floristic Region, research-practice integration, conservation, mapping tool, collaboration, spatial planning

Keep Calm and Conserve On: Battling Eco-Anxiety on the Coalface

Odette Curtis-Scott

Overberg Renosterveld Trust, Setter's Rest, Napier, 7270

Abstract

The Overberg Renosterveld Trust has been active for 13 years. Over this time, we have brought thousands of hectares of Critically Endangered renosterveld into conservation, giving us much reason to celebrate. But conservation on the coalface can be relentless, exhausting, at times delivering zero reward, with no end in sight. As we continue our work towards building resilient landscapes that are better equipped to respond to future threats, how do we ensure that we, as individuals and as a conservation community, build our own resilience? Climate change, habitat loss and ecological degradation are on the rise, despite our best efforts to combat these. Globally, most countries have failed to deliver on any meaningful climate- or ecosystem-related targets. As a result, many ecologists and conservators are experiencing ‘eco-anxiety’ or what is now recognised by psychologists and therapists as ‘ecological grief’. There is a rapidly growing body of research that attempts to unpack this very real issue, as it is causing high levels of anxiety, burnout and feelings of hopelessness in the conservation sector. It is likely that this in turn is causing inertia and possibly even lower productivity in the workplace, where one person often carries the workload of three. It is critical that we address this ‘elephant in the room’ and explore ways in which we can lift this enormous burden, if we are to remain effective in the business of future proofing our ecosystems. In this presentation, I follow up on a talk I presented at Fynbos Forum in 2019, related to eco-anxiety, and discuss some recently-published, tangible measures that focus on peer- and organisational-support, that we as individuals, and as a conservation community, could (should!) consider implementing.

Eco-anxiety, Renosterveld, Ecological Grief

A Fungus Among Us: Exploring Biocontrol of Black Wattle Using Cylindrobasidium torrendii

Philip Daries and Ricardo Januarie

Grootvadersbosch Conservancy- Strawberry Hill Farm, Heidelberg Western Cape, 6665

Abstract

A Fungus Among Us: Exploring Biocontrol of Black Wattle Using Cylindrobasidium torrendii

Invasive alien plants like Acacia mearnsii (black wattle) threaten South Africa's biodiversity by outcompeting indigenous vegetation, depleting water resources, and altering ecosystems. The Grootvadersbosch Conservancy collaborated with Dr Alan Wood (Agricultural Research Council) to test a more cost effective formulation of a promising biological control agent: Cylindrobasidium torrendii, a naturally occurring fungus that targets cut black wattle stumps.
Applied to freshly cut stumps, this species-specific fungus enters the root system, decomposing it over time and preventing regrowth—offering a safe, herbicide-free alternative. During a recent demonstration, Dr Wood trained alien clearing teams in the field application method, which uses a water-based paste applied directly after cutting.

Our ongoing trial assesses the efficacy, practicality, and ecological safety of this biocontrol in real-world conditions. Preliminary observations suggest that C. torrendii could become a vital tool in sustainable alien plant management. This poster shares our methods, early results, and insights into the potential of fungi as allies in fynbos conservation."

Stump-out- Black wattle Biological control agent

Buzzing Bandits: Unravelling the Effects of Nectar Robbing Bees in Erica discolor speciosa

Ruby Davies, Anina Coetzee and Ethan Newman

Miss Ruby Davies and Dr Anina Coetzee: Nelson Mandela University, Madiba Rd, Glenwood AH, George, 6529, South Africa.
Dr Ethan Newman: Rhodes University, Drosty Rd, Makhanda, 6139, South Africa.

Abstract

Nectar robbing, a form of floral larceny where visitors extract nectar without pollinating the flower - typically by making a hole in the base of the corolla - is a widespread yet understudied interaction with potentially significant implications for plant fitness. Although generally considered antagonistic, nectar robbing does not always negatively impact plant reproduction.
In the Cape Floristic Region (CFR), long-tubed, bird-pollinated Erica species are frequently robbed by bees, particularly Cape Honey bees (Apis mellifera capensis) and various solitary bee species. This study investigates the influence of nectar-robbing bees on the reproductive success of Erica discolor speciosa, focusing on how robbers interfere with pollen transfer and legitimate pollinator behaviour, and ultimately influence the plants reproductive success.
Field observations, pollinator exclusion experiments, spectral analysis, and pollen analysis were conducted across three populations.
Results suggest that nectar-robbing bees may significantly influence pollination dynamics, thereby affecting the reproductive success of bird-pollinated Ericas.
These findings deepen our understanding of pollination ecology and offer important insights for conservation and ecological management in the CRF.

Pollination, ecology, nectar robbing, fynbos, Cape floristic region

The Gouritz Cluster Biosphere Reserve: a research destination with multiple opportunities

Wilhelm de Beer
Gouritz Cluster Biosphere Reserve, 2 Barry Street, Riversdale

Abstract

The Gouritz Cluster Biosphere Reserve (GCBR), situated within a biologically rich and culturally diverse region of South Africa, represents a dynamic and multidisciplinary research destination for scholars across the natural and social sciences. Designated under UNESCO's Man and the Biosphere (MAB) Programme, the GCBR (and its similarly named non-profit organization) embodies the principles of sustainable development, conservation, and community integration.

The area includes the Klein Karoo, from Uniondale in the east, Prince Albert in the north, Montagu in the west, and the Langeberg Mountains in the south, as well as the coastal area south of the mountains from Grootbrak to Swellendam.

Its unique configuration—comprising a mosaic of protected areas, buffer zones, and transitional landscapes—offers researchers the opportunity to study interactions between human populations and natural ecosystems in a real-world context.

The landscape encompasses diverse habitats with 101 recognized vegetation types, including fynbos, wetlands, estuaries, forests, and the coastline. As such the area constitutes a living laboratory for biodiversity, ecological, nature conservation, conservation agriculture, and alien invasive research. The GCBR supports collaborative research initiatives with universities and institutions, that aim to inform our conservation efforts.

We offer financial support for research in the region, can facilitate landowner permission, and assistance with ongoing monitoring.
The presentation will highlight some of the current projects supported by the GCBR and inform interested researchers on the criteria and how to apply for support.

Research support, Conservation, Biodiversity

Making the circle bigger –examples of local conservation through shared care

Michelle de Bruyn, Rupert Barnard
Wild Restoration NPC, 98 Main Road, Greyton

Abstract

For our cape floristic region to have a resilient and thriving future, we need to extend the circle of care beyond those that we currently consider to be conservationists. How can other groups become more involved in conservation action, and build restorative relationships with nature? Many groups could have a role to play, including outdoor enthusiasts, youth and schools, creatives, psychologists and counsellors, landowners, local businesses, corporates, philanthropists, cultural, spiritual and religious communities.

This session will share a short video capturing some of these stories. Most of the stories are from the Overberg, but will also include some examples from the Invasive Clearing Action Network in the Cape Floristic Region. It will also share some of the approaches to cultivating connection, volition, agency and action.

These stories and approaches to mobilising wider societal contributions to conservation can provide inspiration to other local areas in the Cape Floristic Region.

Resilience; adaptation; relational conservation; agency

Conservation of Knysna Sand Fynbos

David Edge
Western Heads Goukamma Conservancy, 81 Tulbagh St, Brenton on Sea

Abstract

Knysna Sand Fynbos (KSF) is a Critically Endangered vegetation type of which 83% (12 500 ha) of its original 15 000 ha has been transformed by timber plantations, agricultural activities and urban developments. 75% (1750 ha) of the remaining 17% of this KSF occurs in the Western Heads/ Goukamma Conservancy (WHGC), which hosts populations of many Red List plants as well as three threatened butterfly species. The WHGC therefore applied in September 2022 to the Table Mountain Fund (TMF) for funding to conserve KSF by significantly reducing coverage of alien invasive plants (IAPs), and through passive and active methods restore the KSF to a fully functional ecosystem.
The TMF funding for this 3 year project has allowed us to:

- Inform the public about the plight of KSF through notice boards, articles in local and national press, a website and social media.
- Conduct botanical surveys on 17 properties, thus recording ~530 plant species including 12 Red List species
- Persuade 17 WHGC landowners to become committed to long term conservation of their properties via SANParks or CapeNature stewardship programmes or by declaration of private nature reserves, totalling 350 ha
- Complete first phase removal of IAPs on ~340 ha of this land, and carry out second phase follow ups to remove new IAP seedlings and kill any resprouting IAPs
- Develop a strategic fire management plan for the WHGC, and plan for its implementation, commencing in 2026

Contract National Parks, Invasive Alien Plants, Critically Endangered vegetation, ecological burns

The Effect of Active Versus Passive Interventions on CFR Riparian Rehabilitation Success

Karen J Esler

Dept. Conservation Ecology & Ecology; Private Bag x1, Matieland

Abstract

There is an imperative to recover valuable riparian ecosystem function. either through active (alien [non-native] clearing and revegetation) or passive (alien clearing and spontaneous succession) methods.

To what extent are these interventions working? We focused on multiple Berg and Breede River Rehabilitation Programme (BBRP) riparian rehabilitation sites (ranging between 0.4 – 2 ha in size and two to three years post-rehabilitation) and asked whether active rehabilitation of riparian ecosystems yields higher success, defined here as increased native species indices, compared to passive rehabilitation.

Accounting for differences in soil and geomorphology, we found that the cover, species richness, and diversity of native vegetation was significantly higher following active rehabilitation compared to passive.

Conversely, active rehabilitation had no significant benefit in reducing richness, diversity or cover of secondary invaders and re-invaders compared to passive rehabilitation.

Both actively and passively rehabilitated sites were characterized by secondary invasions of alien pioneer grasses and herbaceous weed species. Some initial impacts on soil (& soil biota) were noted, indicating potential soil legacy effects of alien tree invasions. Importantly, we provide to support riparian rehabilitation as an effective response to ecosystem degradation for achieving improved native vegetation recovery in Mediterranean-type ecosystems, with some benefits of active over passive methods in the short-term, where financial resources are available.

alien clearing, Cape Floristic Region, ecological restoration, fynbos, geomorphology

Guidelines to limit hybridisation when planting indigenous crops within their native range: South African honeybush as a case study

Sjirk Geerts

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Abstract

Guidelines to limit hybridisation when planting indigenous crops within their native range: South African honeybush as a case study

Indigenous plants with commercial value are often moved within their native range for horticulture, floriculture, and agriculture
This creates the potential for gene flow between different species and genetic lineages within species, which could have negative consequences for wild populations. Honeybush,
Cyclopia Vent., is an endemic genus in the fynbos biome with commercial value in the tea industry of South Africa but at risk of genetic contamination.
There are six Cyclopia species recognized for their economic value, which are moved across their native range in the Western and Eastern Cape provinces for cultivation. Here we present a planting guideline to ensure the genetic integrity and conservation of indigenous flora using Cyclopia as a case study.
This guideline considers the barriers of the native range, flowering phenology, ploidy levels, pollinator movement, seed dispersal, harvest time and the origin of cultivated genetic material. These barriers were identified and refined through workshops with the following barriers incorporated into the final guideline i.e. range, ploidy, seed dispersal and pollen-flow distances, and seed source, while the remaining barriers were omitted with sufficient rationale.
The guideline includes risk assessment and management.
This preliminary guideline for planting Cyclopia, and other indigenous crops within their native range, will aid in the conservation of the genetic integrity of these species.

Biodiversity-friendly farming practices, Cyclopia, Honeybush tea

Futuring Fynbos as though People Mattered

Malgas, Rhoda

Abstract

Fynbos futures in the southern Cape are inextricably linked to the past. This is a function of evolution, human occupation, South Africa's precolonial and colonial past, and the socio-economic dispensations of our modern democracy. I argue that Fynbos futures are linked to the past, to cultures and to livelihoods. The latter is demonstrated with reference to Access and Benefit Sharing as a means to address poverty and social injustice in local biotrade sectors. But there are also the day-to-day experiences of nature that supersede policies and legalities, and that have more to do with personal heritage, trauma recovery and economic opportunities. The presentation ends with examples of work that following relational ontologies for desired Fynbos Future outcomes. These include integration across disciplines, across sectors of society, across social, economic and political divides and across knowledge systems. A return to San cosmology reminds us that all the earth is one, and that the future is incumbent on the present, and all who live in it.

The PESEIS river, wetlands and estuaries layer update: challenges and trends in the Western Cape

Jeanne Gouws

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Abstract

The Present Ecological Status, Ecological Importance and Ecological Sensitivity (PESEIS) database informs water resource managers about the current condition of the water resource. A project to update the 2014 PESEIS layers started in 2024, and focused on the rivers, associated wetlands and estuaries of South Africa. A secondary aim is to report on the trends of ecological condition changes of these river reaches. In the Western Cape (including a portion of the Northern Cape), 1637 river reaches where assessed within the E (Olifants/Doring), F (Namaqualand), G (Berg), H (Breede) and J (Gouritz) Primary Catchments. The largest number of reaches occur in the E (Olifant/Doring) and J (Gouritz) Primary Catchments. The assessments utilised the same methods as previously applied in the 2014 PESEIS, which were desktop assessments undertaken by a group of experts with knowledge and experience of the aquatic ecosystems being assessed. Some difficulty was experienced in comparing the updated PES results with that of the 2014 PESEIS due to an improvement in the available information utilised for the assessment. Nevertheless, some positive trends occurred in areas where invasive alien vegetation removal was coupled with revegetation of the cleared banks with local indigenous riparian vegetation. Improvements were also observed in areas where there is a conservation focus. Negative trends are visible in the more arid areas, particularly where recent droughts have resulted in an increased number of dams in the upper catchments and subsequent deterioration of the downstream rivers, wetlands and estuaries.

Ecological Status, Ecological Importance, Ecological Sensitivity

Responsive Renosterbos: exploring dynamic water-use in Dicerothamnus rhinocerotis

Ashleigh Gouws

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Abstract

Despite the urgency to understand vegetation responses to future changes in moisture in the Greater Cape Floristic Region (GCFR), we know very little of the dynamic nature of water-use in many keystone species, such as Dicerothamnus rhinocerotis (Renosterbos). We aimed to examine the continuous responses of Renosterbos to seasonal moisture variations, using a novel external heat pulse sap flow methodology, with a view to improving predictions of impacts of future climate in the region. We measured sap flow and plant water potential of D. rhinocerotis, and relevant environmental variables, at Drie Kuilen Private Nature Reserve from January to July. Measured data were modelled using a soil plant atmosphere continuum (SPAC) model. Measured sap flow closely followed patterns in solar radiation, vapour pressure deficit, and soil moisture, and were well predicted by the SPAC model (R2 = 0.66), suggesting our measurements were a good proxy for transpiration. Transpiration and plant water potentials decreased during the dry summer, and increased following rainfall pulses, suggesting a reliance on shallow soil moisture during summer. This challenges assumptions of this species being deep-rooted. Modelling suggests that D. rhinocerotis will be resilient to moderate increases in temperature and drought, but significantly warmer and drier conditions will negatively impact D. rhinocerotis.

Sap flow, Renosterbos, Transpiration

Assessing the impact of grazing lawns on soil mite and vegetation diversity in the Bontebok National Park

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Abstract

Most rangeland systems around the world have evolved with grazing animals that could have both positive and negative effects on their environment. The Bontebok National Park (BNP) hosts a number of hooved animals, which causes transformations to their habitat, resulting in the establishment of grazing lawns. The proliferation of these lawns could pose a threat to the natural vegetation occurring in the park, as well as the composition of the mesofaunal communities. The aim of this study was to assess how the establishment of grazing lawns affect plant and soil mite diversity in the Bontebok National Park. Line transects were used to assess the plant species diversity and composition of different sizes of grazing lawns, ecotones and intact natural vegetation in the BNP. Soils were also collected and analysed in the laboratory to investigate soil mite species diversity. The BNP was found to be dominated by shrubs and grasses, with compositional shifts taking place from lawns to the natural vegetation for both the vegetation and mite communities. For both plant and mite assemblages, there was a noticeable decrease in diversity in larger lawns, and the greatest diversity was seen in the ecotones. Aboveground and belowground communities interact, which are vital components in a functional ecosystem. It is important to understand how these communities affect one another as it could influence diversity either negatively or positively. This information can also be useful to park management and provides important knowledge regarding soil mite communities in the Fynbos biome, which is not very well studied within a South African context.

Grazing lawns, soil mites, Fynbos, Bontebok National Park

Regenerating environmental stewardship in a coastal informal settlement: challenges and opportunities

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Abstract

Coastal informal settlements catalyse complex intersections of socio-economic and environmental vulnerabilities. This paper draws from an ongoing initiative in Sedgefield, South Africa, aimed at reconciling conservation and well-being within the Swartvlei-Groenvallei dune system—an historic biological corridor for endemic coastal fynbos species. Nestled within these dunes, Smutsville and its expanding informal settlements reflect the challenges faced by many marginalized communities, including limited access to land, inadequate services and infrastructure, and precarious living conditions.

In such sensitive social-ecological systems, both systemic and individual challenges undermine environmental care and heighten social and environmental vulnerabilities. Drawing on 18 months of collaboration through the Dunes and Their People project—including passive and active observations, expert and futures workshops, biodiversity and landscape mapping, and participant feedback—we explored how to foster a culture of care.

While dialogue and collaborative learning lay the groundwork for regenerative transformation, our findings suggest that combining holistic approaches (inclusive language and respectful practices) with technical knowledge (integrating diverse knowledge systems and local expertise) is essential for transformative community engagement. Furthermore, nurturing personal growth, agency, self-esteem, and community connection through multiple and diverse experiences is critical to promoting collective action and environmental stewardship.

However, historical barriers persist. The marginalization of local communities and traditional knowledge systems, the dominance of tourism and property-driven spatial planning, and ongoing socio-economic inequalities continue to erode community-environment relationships. Reclaiming and sharing local stories that foster a sense of place and legacy can play a vital role in rebuilding these connections.

Ultimately, regenerating environmental stewardship in such contexts requires moving beyond politicized rhetoric toward socially and ecologically just environmental governance—grounded in collective care, inclusivity, and intergenerational responsibility.

Environmental stewardship, coastal communities, care, regenerative development, transdisciplinarity, transformative action-research

Science on the ground: Data-driven conservation in the Nuwejaars Wetlands

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Abstract

Science on the ground: Data-driven conservation in the Nuwejaars Wetlands

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With limited resources available for conservation, it's more important than ever to make sure every effort really counts. The Nuwejaars Wetlands Special Management Area spans a massive 47,000 hectares, with half made up of Endangered or Critically Endangered fynbos and renosterveld. In a space that big, knowing exactly where to focus your time and energy is key to getting the best conservation results. Thanks to funding from the Table Mountain Fund, the Nuwejaars River Nature Reserve (the non-profit company managing the area) set out to do just that.
The project's objective was to reduce threats and build resilience in natural fynbos ecosystems by implementing resource management interventions based on data collected on the ground. The numbers speak for themselves: more than 17,000 sightings covering around 1,800 different species were collected. This mountain of data opened powerful new doors for conservation action. With expert help, and integrating historical records, we created a comprehensive threatened species database, and an integrated fire and invasive alien clearing plan. Now, with sensitive area maps in hand, the team can pinpoint the places most in need of protection – utilising vegetation types, fire regimes, current alien plant densities, and other threats. It's a clear example of why boots-on-the-ground data collection is so vital. By knowing exactly what's growing where, the team can take real, informed action to protect this fynbos landscape.

Key words: Nuwejaars, Species of Conservation Concern, Conservation, Table Mountain Fund

Restoration of Garden Route Granite Fynbos

Stuart Hall
Independent

Abstract

Garden Route Granite Fynbos is a critically endangered vegetation type due to habitat loss and poor management of remaining vegetation. A patch of approximately 1.2 ha of this vegetation type on Melsetter Farm near Rondevlei Heights had become invaded by Black Wattle, and encroachment by indigenous thicket and forest tree species due to lack of fire for many decades. Alien trees were removed, followed by clearing of excess woody biomass. An ecological burn was then conducted in late 2024. The habitat has since been recovering well and a diversity of species is establishing, although some missing structural component species will require active restoration over time. This fieldtrip will showcase a local example of a critically endangered vegetation type being restored and managed for conservation on private land, going through the history of the site and discussing details of the process in getting the site to it's current condition, as well as what still needs to happen in future to further improve the condition of the habitat. Although such a project is not unique within the Fynbos region, the local climate and vegetation type have presented different restoration challenges and opportunities, and may stimulate some in-field discussion, as well as providing inspiration for initiating similar projects elsewhere. Since many species may have been present only as seed in the soil before being stimulated by the fire, and it will be the first spring after the burn, this field trip will also be a good opportunity to potentially record some new species to the site.

Critically Endangered Vegetation, Passive Restoration, Active Restoration, Ecological Burn

Law as a Tool for Future Proofing Fynbos: Lessons from Verlorenvlei

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Abstract

Graafwater Sandstone Fynbos and Endangered Leipoldtville Sand Fynbos surround Verlorenvlei, an estuary and freshwater coastal lake on South Africa's southwestern Coast. Verlorenvlei's importance for numerous species of threatened plants, birds, fish and mammals – as well as ecosystem services – is reflected in its recognition by CapeNature as a priority estuary in need of improved conservation and protection, and its status as a Ramsar Wetland of International Importance. Despite this, the future of Verlorenvlei and the biodiversity it sustains is threatened by overabstraction of ground and surface water (largely for agriculture), invasive alien plants, climate change and concerning development within the G30 catchment (including mining and, most recently, transmission infrastructure). We reflect on how law has been used as a tool to future-proof Verlorenvlei and its surrounding fynbos to find lessons that can be used in further future-proofing fynbos within the Verlorenvlei G30 catchment and elsewhere. By considering (a) the constitutional environmental rights and the corresponding constitutional and other legal obligations on the State and private persons; (b) certain specific legal tools available to enforce these rights and obligations; and (c) our experiences and challenges in using some of these specific tools in protecting Verlorenvlei, we propose that diversity is key to best future-proofing fynbos. This means that a range of legal tools must be used in conjunction with non-legal tools, infusing different perspectives, including of local experiences and scientific knowledge. We therefore call for this diverse approach to future-proofing fynbos going forward.

Constitution, Law, Verlorenvlei

Ticking The Box: Does A Decision Support Framework For Management Planning Improve Protected Area Management Effectiveness?

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Abstract

Protected area (PA) management strives to deliver positive conservation outcomes over the long term. PA management effectiveness (PAME) assessment tools weakly measure conservation outcomes because these oversimplify complexity and potentially distort assessment results. Decision support frameworks, like adaptive management, could improve PAME by providing systematic, evidence-based, and collaborative planning, actions and reporting, without which strategies and responses to threats may be misdirected and/or ad hoc. We examined whether adaptive management, in the form of the Conservation Standards decision support framework could improve PAME in South Africa. We focussed on the PA management planning stage of management as a precursor to effective management. For this we used a management effectiveness tracking tool (METT-SA) that uses management elements with indicators: PA context (e.g. legal status), planning (e.g. management plans), inputs (e.g. budget), process (e.g. maintenance), outputs (e.g. staff productivity) and outcomes (e.g. ecological processes). Data came from 38 statutory PAs in the Cape Floristic Region of South Africa. METT-SA scores improved significantly after implementing the Conservation Standards, driving change between assessments by improving planning, input and output indicators however, outcomes indicators declined. METT-SA promoted compliance, but it did not drive adaptive management towards positive conservation outcomes. Our findings highlight the benefit of tools like the METT-SA in prompting the acquisition of necessary plans and inputs and processes to deliver outputs and eventually positive conservation outcomes, and we highlight risk of complying with METT indicators at the cost of quality PA management planning.

adaptive management, decision support, evidence-based management, management effectiveness, Conservation Standards, Cape Floristic Region

Tracking Alien Invasive Plants in Fynbos Using Drones and Machine Learning for Control planning and Eradication

Sean Hill

GeoWing Academy 2015 Kooboo Berry Close Wilderness 6560

Abstract

I have been using drones, GIS and machine learning to map Acacia mearnsii, pine and other invasive alien plants in Wilderness for many years now. We are now able to use these maps and the data to plan clearing projects. Drones can also be used to control large stands of Alien Invasive Plants with precision spraying.

Please see link: https://youtu.be/t5XWv5Q-DdY

Drone, Machine Learning, AIP control

Using Drones & GIS to Monitor Critical Environmental Change in the Garden Route

Sean Hill
GeoWing Academy 2015 Kooboo Berry Close Wilderness 6560

Abstract

Drone technology and Geographic Information Systems Software are changing the way we study the world. By creating an exact digital copy of the environment we are able to visualise, quantify and gather insights in a way that has never before been possible. The speed and accuracy of collecting and analysing data using these tools is a real game changer, we can watch Mother Nature breath for the first time.
The fynbos biome in the Garden Route is under threat from urban expansion, development, alien invasive plants (AIP) and climate change. By utilising technology to monitor changes in real time, we can convert outdated passive management practices into active management planning processes that will enhance the protection of wild spaces and communities alike.

Unmanned aerial vehicles (UAVs) act as scanners, while software renders the data into high resolution maps and 3D models that can be used to; quantify the extent of alien vegetation and create risk assessments related to fire, detect changes within communities related to development, monitor vegetation clearing where development is concerned and machine learning can be used to detect AIP in large areas to name a few examples. The use of customisable apps can be used to ground truth aerial data and also speed up the data capture process. UAVs can even be used to control AIP in areas that are densely populated with precision preventing biodiversity loss.

The applications for the use of this technology are almost limitless. Current use of this technology is also being applied to work being done by Chloe Guerbois of NMU and the Constantia Kloof Conservancy in the Sedgefield and Wilderness areas.

Drones, GIS, Photogrammetry, Machine Learning

An integrative approach to alpha taxonomy in Erica L. (Ericaceae) with three new species from the Western Cape, South Africa

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Abstract

The megagenus Erica L. (Ericaceae) comprises 851 species across its global distribution, with an extraordinary focus of diversity in the Cape Floristic Region (CFR) of South Africa where almost 700 species are endemic. Erica is a high priority genus for taxonomic revision in South Africa and, despite significant taxonomic work over the past century, a significant part of its diversity remains undescribed. Consequently, conservation targets associated with undescribed taxa remain undefined. The sheer size of the genus, its morphological, ecological and geographical variability, and the absence of a modern, consolidated revision also make alpha taxonomy challenging. By combining traditional taxonomic methods, standard DNA sequencing methods building on openly available data matrices, and an openly available specialised taxonomic tool for the genus, we present an integrative, reproducible approach to alpha taxonomy in Erica. This approach provided support for the recognition of three new species from the Western Cape in South Africa and aided in ruling out two further putative new species, confirming one as a natural hybrid and the other as a morphological variation within an existing species. We describe the three new species Erica arida R.D.Hoekstra, Erica hessequae R.D.Hoekstra and Erica inopina J.H.J.Vlok. Ecological and threat assessments revealed that all three newly described species face a high risk of extinction. This study exemplifies the importance of using a modern, integrative and reproducible approach to alpha taxonomy that incorporates ecological and threat assessments as a key foundational step towards conservation planning in taxonomically problematic genera.

Erica, taxonomy, species diversity, threatened species

Functional and evolutionary determinants of recruitment differentiation between Fynbos Protea individuals, populations, and species.

Jessica Howard

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Abstract

Functional traits are expected to determine the response of plants to environmental variation. Understanding the extent to which functional traits vary within populations, among populations of the same species and between species is thus crucial for assessing evolutionary and ecological responses of plants to environmental change. Assessing these responses is particularly important within global biodiversity hotspots such as the Cape Floristic Region (CFR). Proteaceae contribute significantly to the ecological functioning and diversity of this region. The genus Protea of the Proteaceae family is notably resilient to drought conditions, but the seedling stage (recruitment) is more susceptible. Recruitment determines populations growth and restoration success, so determining the underlying variation in seedling functional traits can provide insight into survival and performance of species and populations. Understanding this is crucial for advancing knowledge of fundamental evolutionary and community ecology and is relevant in assessing how global climate change impacts biodiversity to inform conservation management strategies. To address this, a common-garden experiment established at seedling stage for 18 species (each with 9-15 populations) of the Protea genus has allowed for quantification of seedling functional traits and performance in a common environment. Ultimately, this experiment assesses whether Protea species and populations have sufficient genetic variation to allow them to adapt to environmental changes, or if conservation interventions will be necessary under global change, such as assisted migration of species or genotypes.

Functional traits, Protea, recruitment, climate change, conservation management

Doing the Least: The role of Minimum Conductance in drought response in the GCFR

Huw Irlam

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Abstract

(Sincere apologies for the late submission. This would be my first conference, so I would greatly appreciate if you would still keep my abstract in consideration. Many thanks.)

In light of increased drought frequency and intensity due to climate change, knowledge of how plant drought tolerance is affected is important for understanding plant vulnerability to these changes. Minimum conductance (gmin) describes the residual rate of water loss by a plant through its leaves after it has closed its stomata in order to minimise that water loss rate. This parameter wholly determines the speed at which a plant can exhaust its water stores under drought conditions. It is thus a critical piece to understanding plant dry-down time to death.
Recent work has greatly improved our understanding and measurement capabilities of gmin, grounding it in physiological theory. Additionally, gmin has been shown to be a significant variable in models of drought survival.
With this in mind, I present the first minimum conductance data for species from well known fynbos families, namely Proteaceae, Ericaceae, and Restionaceae, as well as several morphologically diverse species from the Renosterveld. Results show a varied array of minimum conductance values indicative of diverse drought strategies, and indicate that gmin should be considered when attempting to understand and predict plant mortality under changing climate conditions.

Minimum conductance, drought tolerance, drought strategy

Medicinal Plants of Fynbos

Roxanne Joubert
Lady of the Herbs | Remskoen, Wilderness Heights

Abstract

Protecting medicinal plants of Fynbos.

Plants have been our medicine since the beginning of our time and will continue to be a resource well into the future. So, what makes them medicine and why should we protect them?

Medicinal plants are threatened by loss of habitat, climate change, ill harvesting practices etc. Through conservation efforts of any biome and its biodiversity, medicinal plants can be protected.

“The plants we need are the ones that grow around us”

When we know what plants occur around us within our biomes and what they offer, then we’ll be able to protect them.

Let’s talk about a few medicinal plants within the fynbos biome and how we can use them:
1. African potato
2. Wild dagga
3. African sages
4. Cancerbush
5. Renosterbos
6. Buchu
7. Pelargonium species
8. Carpet Geranium
9. Ovenbush
10. Impepho (Helichrysum spp)

Hosted by Roxanne Joubert, herbalist of Lady of the Herbs. She focuses on our indigenous medicinal plants of South Africa and is involved in conservation, research, education, sustainable resource development and product production."
Medicinal plants, preserving indigenous knowledge

The role of nectar-rich stepping stones in facilitating bird movement across urban landscapes.

Muneeba Lamera

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Abstract

The Cape Floristic Region (CFR), a biodiversity hotspot in South Africa, is one of the regions most impacted by urbanisation, particularly with regards to pollination mutualisms. The lack of connectivity between vegetation fragments makes it challenging for key pollinators, i.e., nectar-feeding birds, to traverse the urban matrix. The Ingcungcu Sunbird Restoration Project aims to assist birds in penetrating the urban area more effectively by establishing school gardens composed of bird-pollinated plants. However, it is unknown whether these gardens act as stepping stones within a migration corridor since individual nectar-feeding bird movements were not tracked. More generally, distances moved by nectar-feeding birds and how this is influenced by nectar in the landscape is largely unknown. This thesis will ask: 1) How far do Cape nectar-feeding birds move and how does the movement differ spatially and temporally? 2) Are nectar-feeding birds using the Ingcungcu school gardens as stepping stones to access the surrounding protected areas? 3) How is nectar distributed across the urban landscape of Cape Town, and to what extent does this influence nectar-feeding bird distribution? To determine bird movement, bird ringing data obtained from SAFRING will be analysed. To determine whether the birds are using the gardens as stepping stones, individual birds will be captured using mist nets and ringed with a PIT tag leg band. Every time the tagged individual visits a site with the RFID detection station set up, its presence will be recorded. For nectar availability, floral surveys will be carried out in residential areas to quantify the nectar available per hectare in different parts of Cape Town. Bird-pollination; urban ecology; stepping stones.

passive-integrated transponder; nectar availability; nectar-feeding birds

Fynbos and Butterflies - protecting the Threatened Butterflies of the Western Cape

Keir/Alouise Lynch
Bionerds PTY Ltd

Abstract

Safeguarding Skollies, Rangers and Opals: Conservation of Threatened Butterflies of the Western Cape

The Western Cape is home to a remarkable diversity of highly localised and threatened butterfly species, many of which are restricted to fragmented patches of Fynbos habitat increasingly impacted by agricultural expansion, invasive species, and altered fire regimes. In response to these growing pressures, the Endangered Wildlife Trust, with support from the Table Mountain Fund, is implementing a targeted conservation project to secure the long-term survival of priority butterfly species through evidence-based planning and cross-sector collaboration.

At the heart of this initiative is the development of Biodiversity Management Plans and species-specific management guidelines for threatened butterflies in the region. These tools aim to translate ecological understanding into practical, actionable strategies for landowners, conservation authorities, and land management teams. Fieldwork conducted across multiple key sites is validating historical records, identifying intact habitat remnants, and supporting the protection of critical areas while deepening our understanding of the ecological features essential for species persistence.

The project takes a landscape-scale approach, recognising the importance of ecological connectivity and the role of both protected and privately managed land. Strong partnerships with private landowners, stewardship sites, and local stakeholders are central to the process, ensuring that conservation planning is grounded in local realities and geared toward meaningful, lasting impact.

This presentation will share the project’s objectives, methods, and early outcomes, offering insight into the challenges and opportunities of conserving lesser-known invertebrate species within the fragmented and dynamic Fynbos biome. In doing so, it contributes to a more inclusive, strategic approach to biodiversity conservation in the Cape Floristic Region." Threatened Butterflies of the Western Cape

Hydraulic parallels: comparing drought responses in Renosterveld and Fynbos Shrubs

Dunja Mac Alister

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Abstract

Climate change is likely to intensifying drought conditions in the Greater Cape Floristic Region (GCFR) through increasing temperatures and less rainfall. Within the GCFR, Renosterveld is one of the most critically endangered habitats due to historic use of land for agriculture and grazing due to its rich soils. Dicerothamnus rhinocerotis, renosterbos, is a key species within the Renosterveld and yet its resilience to climate change is poorly understood. The physiological and phenological responses of renosterbos were investigated under ambient and experimental drought conditions to assess structural, physiological and reproductive responses to drought. Rain exclusion shelters were set up in Drie Kuilen Private Nature Reserve and continuous sapflow, growth and weather data were collected along with monthly measurements of water potential and phenology. Optical vulnerability curves established critical hydraulic thresholds. Despite significant reductions in midday water potential and sapflow, renosterbos was able to maintain positive monthly growth and reproductive activity, including flowering and seed production, during drought conditions. Compared to co-occurring species, renosterbos exhibited minimal canopy die-back and a delayed decline in growth under drought conditions. Vulnerability curves and monthly water potentials indicated a conservative water use strategy where plants in the field were able to maintain water potential levels above critical thresholds, allowing the plants to operate within safe hydraulic thresholds. These findings suggest that renosterbos plants possess a suite of traits conferring drought resilience, supporting their persistence under extended drought conditions as well as their potential role in future-adapted ecosystem restoration strategies. climate change, drought, renosterbos

Aspects of the sustainability of the cultivated honeybush tea industry, South Africa

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Abstract

Honeybush tea (Cyclopia spp.), a naturally sweet, caffeine-free herbal tea endemic to South Africa's Fynbos biome, is experiencing a pivotal shift from wild harvesting to cultivation. Historically reliant on wild populations, the honeybush tea industry faced ecological and socio-economic pressures, including habitat loss, overharvesting, poaching, and species decline, particularly for C. intermedia and C. subternata. However, for the first time in 2022–2023, honeybush cultivation surpassed the bulk annual production from wild harvesting, marking a key moment in the industry's evolution. This research used a sustainability framework (from the Union for Ethical Biotrade) and mixed-methods approach to investigate the aspects of successful and unsuccessful cultivated honeybush enterprises. Objectives included updating the cultivated honeybush tea industry inventory, analysing environmental, economic, and social practices in successful enterprises, examining challenges faced by less successful and community-based operations, and developing a sustainable resource use framework. Field surveys, species distribution modelling, land-use change mapping, and interviews highlighted key challenges to the industry, including inadequate financial or natural capital, limited market visibility (particularly domestically), low returns for harvested and processed tea, and challenges with operating at a small scale. More successful enterprises were notably characterised by sufficient financial and natural capital, integrated value chains, mixed-farming systems, established market access, and semi-natural honeybush stands. The resulting sustainability framework integrated geographic and multidisciplinary insights to support a more resilient and sustainably responsible honeybush cultivation sector (at the forefront of its gradual evolution).

Honeybush tea, Cultivation, Sustainability, Geography

Post-fire flowering enhances pollinator visitation and reduces florivory and nectar robbing in some species of sunbird-pollinated plants

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Abstract

Tubular flowers optimize pollen placement and typically attract specialized pollinators. However, their unique shape also makes them susceptible to exploitation by some insects and birds. These exploiters either consume or damage flowers (florivory) or access nectar by damaging the floral tube without pollinating (nectar robbing), reducing visits from legitimate pollinators. However, in areas where vegetation has burned within two years, flowers may be less affected by florivory and nectar robbing due to reduced abundance or satiation of these exploiters after a fire. This study examined florivory and nectar robbing in three bird-pollinated plants (Watsonia pillansii, Erica cerinthoides, and Satyrium carneum) and their effects on sunbird visitation rate in early-stage and late-stage post-fire fynbos vegetation across three nature reserves in the Cape Floristic Region, South Africa. In 42 plots (10 x 10 m) in three reserves, we recorded the number of flowers with robber holes, florivory damage, and intact flowers. We also monitored insects, sunbirds, and their behaviour, and quantified pollinator visitation rates. Post-fire flowering increased pollinator visits to all species and decreased florivory levels in two study species, but had no effect on E. cerinthoides. Similarly, robbing rates decreased after fires in two species, but increased in S. carneum. Bird pollinators tend to avoid plants with greater florivory across all species, but nectar robbing impacts on pollinator visits varied between plant species. These behaviours, varying between plant species, could influence plant-pollinator relationships and plant reproductive success. Future studies could elucidate how florivory and nectar robbing impact the reproductive success of these plants.

Florivory, Fynbos, Mediterranean Ecosystems, Nectarivorous birds, Nectar robbing, Visitation rate

Deterrent of chili flake-coated seeds on rodent granivores using a field cafeteria experiment: implications for Lowland Fynbos restoration

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Abstract

Seed predation by rodent granivores is a significant challenge in restoring ecosystems. Unsuccessful seedling recruitment from both active (direct seeding) and passive restoration (i.e. spontaneous succession) in Lowland Fynbos may be due to seed predation by rodents. Moreover, the alien slash stacks remaining after fell and stack clearing of woody invasive trees, are hypothesised to shield granivores from predators, thus intensifying granivory and impacting spontaneous native species recovery. Coating native seeds with predator repellents containing capsaicin has been demonstrated to improve the effectiveness of plant restoration by deterring seed predation. This study tested chili flake (capsaicin) deterrent effects on granivores using Cliffortia polygonifolia, Phylica cephalantha, and Trichocephalus stipularis fynbos seeds. Seed polymer coating technology was used, with uncoated seeds serving as controls in a field cafeteria experiment. It was hypothesized that capsaicin-coated seeds would deter rodent granivores and that seed removal would be lower in more exposed locations, further from the protection of alien slash stacks. Results confirmed that rodents avoided chili flake-coated seeds, with significantly fewer removed seeds compared to uncoated seeds. Moreover, alien slash stacks were shown to be harbouring places for rodent granivores, as higher numbers of uncoated seeds removed by the rodents were observed close to alien stacks. Findings suggest that removing slash stacks before direct sowing in active restoration sites may help reduce seed predation, promoting successful seedling establishment. However, further research on direct sowing of chili flake-coated seeds is needed to confirm whether capsaicin coatings effectively improve seedling establishment in Lowland Fynbos following slash stack removal.

Seed predation, capsaicin, fynbos restoration

Is wild honeybush harvesting sustainable

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Abstract

Honeybush (tea) is a uniquely South African product, made from the processed biomass of Cyclopia species. Cyclopia intermedia - the most widespread wild-harvested species, makes up 50% of the annual crop of 300 tonnes and is a locally significant industry affecting the livelihoods of harvesters, farmers and processors in the greater Langkloof region of South Africa. This research investigated the sustainability of the wild honeybush industry through a mixed methods approach, addressing four objectives: mapping species distribution, documenting best practice harvesting according to local, traditional and scientific knowledge, assessing enterprise-level sustainability, and analysing the ecological impacts of harvesting on populations.

Mapping efforts produced a species distribution map covering 11 496 km², 50 % of which falls within formally protected areas, while active harvesting takes place across 100 km2. Best practice harvesting guidelines were developed based on extensive interviews, field observations, and harvest surveys. Harvesting enterprise assessments found that small, experienced family teams and well-organised farm-staff teams, practising harvest intervals of four years, can achieve sustainable yields and livelihoods. Three out of six farms practising 50% cropping at short intervals showed declining harvest yields and harvester livelihoods. Statistical analysis of plant allometry in unharvested and harvested populations indicated that plant vigour was not affected by harvesting, the biophysical environment or fire history, while pod surveys revealed that fecundity in these long-lived resprouting plants is reduced by harvesting. The research demonstrated that harvesting of wild C. intermedia is sustainable under appropriate management conditions.

The research concludes with a discussion of the main challenges to the industry which include: invasion by alien plant species, climate change, increased fire frequency and intensity, over-regulation, low market demand, lack of capacity in government agencies that engage with the industry, unreasonable biotrade -market regulations imposed by national and international organisations and buyers.

Honeybush, Cyclopia intermedia, sustainability, challenges

Assessing the response of Aspalathus amoena to different disturbance regimes in Breede Alluvium Fynbos agroscapes in the Western Cape, South Africa.

Fadwa Mohammed

Western Cape Department of Agriculture

Abstract

Aspalathus amoena (Critically Endangered) was present in areas where the soil was disturbed and cleared for agricultural development. The remaining natural areas on the farms have a high conservation value. If there is no proper farm planning or if the current conservation strategy of land use exclusion in some alluvial Fynbos habitats continues, the species Aspalathus amoena may likely go locally extinct. This study aims to understand the ecology and distribution of seemingly secondary successional plant species, such as Aspalathus amoena and intact patches of alluvial Fynbos in the Breede River area to ensure proper land use and farm planning to protect the species. It is hypothesized that Aspalathus amoena is a pioneer reseeder in secondary succession and thrives on periodic disturbance. Sixteen vegetation monitoring plots will be set up. The disturbance types that will be examined are brush cutting, veld fires and ploughing. Due to the vegetation characteristics in the study site, the plots will be 20x5 meters in size to accommodate larger and smaller plants. Within the plots, plant species diversity, composition, structure and life form diversity will be assessed. A corresponding 100m transect line at the site will be used to assess vegetation cover through the descending point method. Sites will be monitored for a full year to capture species that may be dormant during a certain time. Conserving natural vegetation would ensure the presence and movement of biodiversity on a farm, the connectivity of natural vegetation and resources and ultimately a healthier Agro-ecosystem. Fynbos, disturbance regimes, conservation, land use planning

Highly Hazardous Pesticides: The Impact of their use in the Fynbos Biome

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Abstract

Highly hazardous pesticides (HHPs) pose significant risks to human health & the environment in developing countries. The precautionary principle, & United Nations Food & Agriculture Organization's (FAO) Code of Conduct on Pesticide Management Article 7.5 which deals with HHPs,was used to develop and ratify the HHP strategy at the SADC level to facilitate the identification and phase-out of HHPs, as HHPs have been identified as a global risk to humans & the environment. This initiated a global move through organizations like the Global Framework of Chemicals (SAICM) to ban, phase out, and/or restrict the use of HHPs. South Africa has 124 HHPs registered for use, of which 88 are environmental toxicity pesticides, that accounts for 71% of the total, with agriculture totalling 90%. The HHPs were identified & categorized using the FAO/WHO JMPM criteria where hazard criteria 7 & 8 relate to environmental exposures and impacts on ecosystems. 57 HHPs registered directly impact pollinators. Neonicotinoids were developed as alternatives to organophosphates but are just as harmful as they are residual, persisting for long periods in plants and soil. Neonics are associated with colony collapse syndrome in pollinators & harmful in small quantities.Neonics have been found in pollen & nectar & are highly toxic to honeybees, bumble bees & solitary bees, at sub-lethal levels cause flight & navigation problems, reduced taste sensitivity, slower learning patterns, impacting on their foraging abilities and hive productivity.
Pesticide contamination in soil can lead to a reduction in species richness in soil organisms, and decreases in species diversity in fynbos ecosystems. The impacts of the utilization of HHPs on the environment and subsequent climate change impacts through the increase in temperature by 6% of the 40% Industrial sector contribution to the GHG emissions will impact the UNFCCC targets.

HHPs, ecosystem services, pollinators, environmental fate, climate change

Latest developments on pesticides: The impacts on the fynbos biome

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Abstract

There has been a global move towards banning or phasing out highly hazardous pesticides (HHPs), that has gained traction with the Global Framework on Chemicals (GFCs) urging the phasing out of HHPs to protect human health and the environment. The Registrar of the Fertilizers, farm Feeds, Agricultural Remedies and Stock Remedies Act, Act No. 36 of 1947 has identified the Carcinogenic, Mutagenic and Reproductive Toxicity (CMRs) to be prioritized. There are 62 CMRs listed and all 62 are environmental toxicity pesticides. 35 of these are toxic to bees, impacting the pollination of critical crops in agriculture and indigenous species in the fynbos biome, an example is the bumble bee, the only pollinator for potatoes that has been severely impacted by the agricultural use of neonicotinoids such as difethialone, epoxiconazole and adjuvants such as ethylene oxide. The use of hexachlorobenzene, a pesticide listed under the Rotterdam and Stockholm conventions, may result in colony collapse disorder (CCD), leaving behind the queen, food and nurse bees while the worker bees disappear, severely impacting the ecosystem services of the fynbos biome. The use of neonics in agriculture has been linked to bee behavior issues and weakened immune systems, potentially making bees more susceptible to pathogens and ultimately their death. The EPA and other environmental authorities have developed legislation to protect bees, and Act 36, in its Amended Regulations Relating to Agricultural Remedies (GG. No. R.5399, published 11 October 2024), under Registration Requirements, it does mention that the risk assessment for the registration of an agricultural product must, under Section 3(h)(xiv), include data on the effect on bees and other pollinators and the data must be generated by a SACNASP registered scientist.

HHPs, ecosystem services, ban/phase out, environmental fate

Future-Proofing Fynbos: Creating Desire and Opportunity

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Abstract

To “future-proof” biodiversity is to take proactive steps to ensure ecosystems remain viable in the face of future challenges. In this context, the opposite of future-proofing, according to AI, echoes the language of the IUCN Red List: vulnerable, at risk. Only humans possess the foresight and agency to intentionally future-proof anything. But what motivates humans to act?

Desire stems from an expectation of satisfaction tied to resolving a real or perceived need. Nature satisfies us emotionally, socially, and spiritually: it reduces stress, fosters creativity, and offers a sense of purpose. At the same time, a healthy natural environment meets critical needs like water regulation, fire risk reduction, carbon storage, and clean air.

The challenge is making this value tangible. In South Africa, we must connect the satisfaction of caring for nature with Maslow’s basic needs. At Nature Connect, we believe part of the answer lies in linking nature to daily life through job creation and community engagement. We see job opportunities growing in three key areas: water security, fire risk reduction, and eco-tourism. These sectors require specialised skills — particularly in invasive alien species removal. Our Green Skills programme offers accredited training, mentoring, and work-based learning to equip youth for employment in this space.

We also create opportunities for people to experience fynbos directly — through school programmes, community walks, and volunteer days. We make it rewarding through team-building and green job pathways, and we make it shared by building community around conservation. We collaborate widely to inspire more people to love and protect nature.

To future-proof fynbos, we must build a culture that values it. That means understanding what drives human desire, and linking it to conservation action. Nature Connect seeks to play its part, so we can ensure future generations inherit a thriving, functional fynbos landscape.

fynbos Conservation; Motivation; Opportunity

Conserving the Klein River Estuary and Its Fynbos Landscape

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Abstract

The Klein River Estuary, located near Hermanus on South Africa's southern Cape coast, is one of the country's most ecologically valuable estuarine systems. It is a critical fish nursery, waterbird refuge, and ecological corridor, linking catchment to coast. Bordering the estuary is Agulhas Limestone Fynbos, a critically endangered vegetation type, with high levels of plant endemism, supporting more than one hundred threatened plant species. Poorly protected, much of this habitat has been lost or degraded due to agriculture, development, invasive alien species (IAP), and altered fire regimes. BirdLife South Africa is working to conserve this unique landscape through biodiversity stewardship and integrated habitat restoration. Biodiversity assessments covering over 2,000 hectares have documented over 250 plant species and a rich bird community, including several plant and bird Species of Conservation Concern. Recent progress includes the development and implementation of IAP management unit clearing plans across confirmed stewardship sites. Clearing efforts initiated in degraded wetland areas have led to visible ecological recovery, with the return of wetland bird species during seasonal flooding. These efforts are guided by comprehensive Environmental Management Plans and Annual Plans of Operation, supporting the declaration of new nature reserves and a protected environment in critical biodiversity areas. Community engagement and partnership remain central to long-term success, enhancing landscape protection and environmental awareness. Strengthening collaboration with the Klein River Estuary Advisory Forum will further support a resilient, community-driven conservation network. Together, targeted restoration and inclusive stewardship are securing ecosystem health and climate resilience in the Klein River fynbos-estuarine system.

estuaries, fynbos, protected areas, OECMs, habitat restoration, invasive alien plants, stewardship

Reintroduction of Marasmodes undulata in Cape Lowland Renosterveld: A Collaborative Conservation Effort

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Abstract

Marasmodes undulata is a critically endangered species endemic to the Cape Lowland Renosterveld, one of South Africa's most threatened vegetation types. With only 5% of its habitat remaining—due to agriculture, urban expansion, and invasive species—this species faces an extremely high risk of extinction. In 2005 there were 20 recorded species in Orleans Park, Paarl and currently only three species in the wild are known.

A collaborative recovery initiative between CREW, Paarl Drakenstein Municipality, and Stellenbosch University Botanical Garden (SUBG) has aimed to reinforce population numbers through propagation and reintroduction. Seeds collected in the 1980s and stored at the Millennium Seed Bank were germinated and cultivated at SUBG. In 2025, over 150 individuals were reintroduced into habitat adjacent to the original site. This marks the first substantial reinforcement effort for the species. Continued monitoring and adaptive management are essential due to its short lifespan and dependence on fire for regeneration.

This project demonstrates the value of long-term ex situ conservation, collaborative partnerships, and site-based stewardship in conservation critically endangered.

Critically endangered species, Reintroduction, Restoration

The effectiveness of South Africa's National Botanical Gardens in supporting ex-situ conservation of threatened species.

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Abstract

Efforts to conserve threatened plant species have prompted botanic gardens worldwide to implement complementary strategies that combine insitu conservation efforts with exsitu techniques for the cultivation and storage of species. A well-managed living plant collection is one that has up to date records of plant species introduced over time, and a good representation of genetic diversity. The purpose of this study is to assess how well South Africa's National Botanical Gardens (NGBs) aid in the conservation of threatened plant species. To achieve this, we firstly conducted a ground-truth survey and inventory of Red-Listed species in South Africa's NBG's and secondly, assess the genetic diversity of exsitu collections in South Africa's NBGs using the genus Nerine as a case study. Preliminary results reveal that from the prioritized Red-list, at least 30% of threatened species are conserved in the NGB's, with the category VU (Vulnerable) being the highest conserved red-list category. Results also revealed that collections are made up of high percentages of succulent, shrub and geophyte species, with the Succulent Karoo and Fynbos being the most represented in biomes in ex situ living plant collections. Insights into the loss and gain of threatened species in NBGs will also be shared. Genetic diversity of two threatened Nerine species in ex situ conservation will be presented and compared to wild populations. This study highlights the need to increase plant collections and focus on the management of living collections to ensure a larger percentage of threated species are incorporated into exsitu collections and that there is enough genetic representation in ex situ living plant collections of threatened species.

Conservation, Threatened, Living Collections

The Plight of Clivia mirabilis: A Case Study in Urgent Conservation Action

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Abstract

Clivia mirabilis, a striking cliff-dwelling species endemic to a single location bordering the Northern and Western Cape. The species was only formally described in 2002 after being discovered by chance in the mid-1990s. Its unique habitat and deep orange flowers made it an instant target for collectors. Listed as Endangered on the Red List of South African Plants due to its highly restricted distribution and very small population, C. mirabilis has always been at risk. Until recently, its remote location offered some natural protection.
However, since 2023, the species has come under severe threat due to a surge in illegal harvesting. Despite the implementation of protective measures, including trail cameras, fencing, and regular patrols, poachers have persisted, repeatedly targeting the population. Tragically, more than 90% of known wild individuals have now been removed. This devastating loss has prompted an urgent reassessment of the species' conservation status, which will be updated to reflect this decline.
Confiscated plants retrieved through law enforcement efforts are now being used to develop species recovery protocols. These efforts aim to understand the propagation requirements of C. mirabilis and explore the feasibility of restoring viable subpopulations in secure sites within its natural range.
This case study highlights the extreme vulnerability of narrow-range endemic species to poaching and the limitations of conventional protection measures when faced with a persistent illegal trade. It underscores the urgent need for continuous population monitoring, stronger law enforcement, and enhanced collaboration among conservation agencies, botanical gardens, landowners, and law enforcement bodies. Only through coordinated action can we hope to prevent the extinction of Clivia mirabilis and other similarly imperilled species in South Africa’s biodiversity hotspots

Threatened, IUCN, Poaching, Ex-situ conservation, species recovery

Wood Structural Diversity Across Mediterranean-Climate Biomes: Comparing Fynbos, Chaparral, and Maquis

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Abstract

Fynbos, the characteristic shrubland of the Cape Floristic Region, is one of five Mediterranean-climate biomes, alongside maquis (Mediterranean Basin), chaparral (California), matorral (Central Chile), and kwongan (Southwestern Australia). We compiled wood anatomical data for 226 species across 65 genera and 14 families in fynbos and compared these findings with published data from chaparral and maquis.

In fynbos species, we confirmed the association between the presence of fiber-tracheids and low vessel grouping. Notably, fynbos differs from chaparral and maquis in its complete lack of ring-porosity and the very low incidence of semi-ring-porosity—traits likely linked to the rarity of deciduous species, itself a probable consequence of the region's nutrient-poor soils.

Fynbos also stands out for having the highest proportion of species lacking tracheids and the lowest frequency of helical thickenings on vessel walls. These features may reflect lower drought tolerance due to the biome's relatively mild dry season. Some inter-biome differences—such as the frequency of fiber-tracheids and vasicentric or vascular tracheids associated with large vessel groups—can partly be explained by differences in taxonomic composition.

Compared to fynbos and chaparral, maquis exhibits a higher proportion of species with distinct growth rings, larger vessel diameters, and lower vessel frequency, likely reflecting the more frequent presence of relatively tall tree species in that vegetation type.

secondary xylem, drought adaptation, trait evolution

The role of biocontrol in future-proofing fynbos

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Abstract

Invasive alien plants (IAPs) are one of the major threats to the Fynbos Biome. Without suitable management interventions, the negative impacts from IAPs will steadily increase. The scale of the problem is massive, and in order to achieve control, we must use every tool available to us, including biological control. Biological control is the use of natural enemies (usually herbivorous insects or fungi) from the indigenous distribution of the IAP. The natural enemies are studied to ensure that they can only feed on the target IAP and no other plant species, and are then released where the IAP is problematic. When they are released they are referred to as biocontrol agents. A successful biocontrol agent will reduce the negative impacts of the IAP without harming indigenous biodiversity. Over the last 120 years, over 130 biocontrol agents have been released against 54 IAP species in South Africa. About 66% of the agents have reduced the negative impacts of the target IAP, and 25% have resulted in complete control. Many of these agents are already benefiting the Fynbos Biome. Unlike other control methods, biocontrol offers a permanent solution because after the agent is established, investment in the project can be reduced or stopped completely, but the agent will continue to control the IAP forever. To future proof the fynbos, greater investment in the development of safe and effective biocontrol agents for IAPs is essential.

Biological control; invasive alien plants; integrated control

Investigating the effects of compound disturbances on fynbos shrublands in the Cape of Good Hope Nature section of Table Mountain National Park, South Africa

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Abstract

The composition, structure and function of the vegetation in the Fynbos Biome, like other Mediterranean-type ecosystems, has been evolutionarily shaped by summer drought and wildfire, but are negatively impacted by invasive species and climate change. These environmental conditions frequently co-occur and interact as compound disturbances, often exacerbating their independent effects. The present study aimed to investigate the independent and compound effects of extreme drought, legacy of alien species invasion and wildfire on floral diversity in the Cape of Good Hope Nature section of Table Mountain National Park using a longitudinal vegetation survey undertaken between 1966 and 2021. The dataset includes five field surveys: 1966, 1996, 2010 and two previously unpublished surveys – one during a severe drought in the austral summer of 2017, and another following substantial winter rainfall 2021. We expect that the findings of Slingsby et al. (2017), i.e. a decline in plot diversity due to intensifying post-fire summer weather events and legacy effects of alien plant densities decades after being cleared, will endure for the most recent surveys of the same plots. Preliminary results indicate that species richness differs significantly between survey years (ANOVA: $F(4, 313) = 5.17$, $p<0.001$), with the drought year (2017) showing significantly lower species richness compared to 1966 and 1996. Further analysis of growth form responses and post-fire recovery strategy (resprouter/reseeder) will illuminate the relationship between floral diversity, historical alien plant densities, and severe drought in the post-fire environment in Cape Point. Understanding these interactions is essential for guiding further research and informing conservation strategies aimed at maintaining the resilience of these fynbos shrublands under a warming climate.

Drought, wildfire, compound disturbance, Cape Point, Table Mountain National Park

Long-term vegetation recovery monitoring following Acacia saligna and Eucalyptus camaldulensis removal in the Western Cape Province of South Africa

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Abstract

There is a need for more site-specific and long-term studies to understand invasion dynamics, impacts of invasive species, their management, and restoration initiatives, so that restoration efforts are guided by research and best practice. In this study, we investigated the recovery of native vegetation after removing Acacia saligna and Eucalyptus camaldulensis 10 to 15 years ago. Vegetation surveys were conducted in 10 × 10 m plots across 11 sites along the Berg River (BR) and Blaauwberg Nature Reserve (BNR) in the Western Cape, South Africa, assessing cover, diversity, richness, and composition during spring and summer. Data from cleared sites were compared to adjacent reference sites. Across both seasons, the results showed improved vegetation cover, richness, diversity, and composition across the cleared sites, but secondary invaders were also recorded. The trajectory of vegetation recovery follows a positive recovery 10–15 years after IAPs removal. However, the proliferation of secondary invaders is slowing down the process. Restoration efforts should initiate control measures aimed at removing and suppressing secondary invaders if restoration efforts are to be successful.

Restoration, Long-term monitoring, Invasive alien plants (IAPs), vegetation recovery

From Data to Decisions: Key Insights from the 2025 Western Cape State of Conservation Report

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Abstract

Biodiversity in the Western Cape is the foundation of ecological resilience, food security, and sustainable livelihoods, yet it faces intensifying pressure from land-use change, invasive species, and a rapidly warming climate. The 2025 Western Cape State of Conservation Report provides an annual snapshot of how effectively our species, ecosystems, and protected areas are responding to these stressors while aligning with the newly gazetted 2023 Western Cape Biodiversity Spatial Plan and the 2025 Western Cape Protected Area Expansion Strategy. Headline results signal clear progress. Strategic stewardship agreements and targeted land purchases secured an additional 13 117.41 ha for the period under review, extending CapeNature's protected-area estate to 1 095 428 ha as at 31 March 2025. Wildfire preparedness also improved: a new aerial-support contract enabled crews to attend to 97 fires, containing 47% of them to <10 ha and thereby significantly curtailing potential habitat loss. The report also spotlights advances in data standardisation and accessibility across CapeNature's monitoring network. A newly deployed prioritisation tool evaluated >250 species, sharpening the focus of long-term surveillance programmes and guiding resource allocation for the coming decade. In marine, freshwater, and estuarine realms, CapeNature's Conservation Operations recorded encouraging trends – for example, stable species assemblages inside the Betty's Bay Marine Protected Area. Collectively, these findings emphasise the power of evidence-based management and multi-stakeholder collaboration. They also highlight areas requiring additional effort. The 2025 report therefore serves both as a scorecard of recent achievements and a roadmap for accelerating adaptive, data-driven conservation across the Western Cape.

State of Conservation, Western Cape, Biodiversity, Strategic Alignment

Testing the Limits and Potential of Remote Sensing for Mapping Biological Invasions and their Impacts in the Global South

Alanna Rebelo

Fynbos Forum, August 2025

Biological invasions, particularly of invasive alien trees (IATs), impact ecosystem function as well as biodiversity. In resource-constrained countries, e.g. in the Global South, this places burdens on the economy and there are few resources available to tackle the problem. This is where freely available remote sensing data can add value.

Which freely available datasets are best for mapping IATs in South Africa? We analysed the trade-offs between spatial and spectral resolution for mapping different taxa of IATs in a South African grassland. Random Forest Classifications of three different freely available sensors were compared; specifically: SPOT 6 (6 m spatial resolution, 4 bands), Sentinel-2 (10 m, 11 bands), and EMIT (60 m, 285 bands). For these three datasets we found that all three spaceborne sensors performed similarly, however fusion of hyperspectral and multispectral imagery led to a significant improvement in accuracy (~5%). But how does this approach compare with managers estimates? We compare classification results with SANParks managers surveys.

How would costly airborne hyperspectral and LiDAR data collected by the NASA campaign in the Cape Floristic Region add value for IAT mapping? A comparison between machine learning classifications of four IAT taxa: pine, gum, wattle and hakea, yielded accuracies of 89-94% and 80% for multispectral spaceborne Sentinel-2 imagery and the NASA imagery (fused AVIRIS hyperspectral and LVIS lidar) respectively. Does airborne hyperspectral data add value in discriminating sparse invasions and classifying IATs to species level?

To explore the impact of IATs on one aspect of ecosystem function: evapotranspiration, we validated eight freely available satellite products against field-measured data from 14 flux towers over a climate gradient across South Africa. The top five satellite-derived evapotranspiration products performed well (r_s: 0.75–0.83), with some performing better in certain bioclimates, but WaPOR and FLDAS emerged as superior in many cases. Using this model, we explored the impact of ecological restoration to the native vegetation following alien tree clearing (only invasions, not plantations) in the Luvuvhu, Sabie-Crocodile, Tugela and uMzimvubu catchments in South Africa. We found that restoration could make ~110 million m^3 water available each year, which is enough water to supply the equivalent of almost a million households.

Bridging Vision and Action: Insights from the CFRP 2025 Strategy Sessions

Lesley Richardson
Cape Floristic Region Partnership (CFRP)

Abstract

The Cape Floristic Region Partnership (CFRP) is a platform where cooperation and innovation supports a resilient future for the Cape Floristic Region (CFR). The CFRP has recently embarked on an ambitious and inclusive initiative to co-develop a long-term strategy for collaborative conservation effort over the next decade. This presentation will share key insights and outcomes from two parallel strategy sessions held in May 2025, designed to integrate both visionary and practical approaches to integrated partnership planning and strategic partnership development

Session 1, held in Stellenbosch, brought together CFR partners and stakeholders to identify strategic priorities, gaps, and collaborative opportunities aligned with South Africa's national and international commitments. This session focused on practical outcomes, exploring the value of the partnership in enabling impacts that are unachievable, or less effective, through individual efforts including mechanisms for coordination and collaboration.

Session 2, a three-day residential retreat near Gansbaai titled "Retreat to Restore," engaged a smaller group of 11 participants to explore the deep interconnection between personal and ecological transformation, facilitated by Wild Restoration NPC and The 4Rivers Initiative. Rooted in the principles of Theory U and guided by practices such as Social Presencing Theatre and 3D Systems Modelling, the retreat emphasized inner leadership, embodied presence, and nature as a co-teacher. Participants were encouraged to move beyond analytical thinking and engage with intuitive, relational, and holistic ways of knowing. Key themes included systemic transformation, inclusive stakeholder engagement, and the need for regenerative, people-centered approaches to conservation. The retreat highlighted the importance of shifting values, embracing creativity, and recognizing the spiritual and emotional dimensions of ecological work. Tangible tools and insights were offered to support ongoing strategy development within the CFRP, aiming to catalyze meaningful, systemic change.

Together, these sessions represent a dual-track approach—balancing structured, goal-oriented planning with creative, systems-based thinking. The presentation will highlight how this innovative process is shaping a more adaptive, inclusive, and impactful conservation strategy for the Cape Floristic Region.

Key Themes:

- Dual-Track Strategy Development: Integrating “left brain” (strategic, analytical) and “right brain” (creative, relational) approaches.
- Collaborative Visioning: Defining long-term goals and a shared vision for the CFRP.
- Systems Thinking and Relationship Building: Insights from the Theory U-based retreat.
- Strategic Alignment: Ensuring coherence with local, national, and global conservation frameworks.
- Next Steps: How the outcomes will inform the how the outcomes will inform the continued development of the CFRP Strategy, Action and Communication Plans, and their future implementation.

Cape Floristic Region; Collaboration; Coordination; Strategy; Innovation; Resilience; Restorative; Vision.

Spatial and temporal variation in the diversity, abundance, and energetic returns of underground storage organs on the coastal lowlands of the Cape Floristic Region, South Africa

Cowling RM

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Abstract

A rich, abundant, and nutritious flora with underground storage organs (USOs) is deemed an important energy source for Stone Age hunter-gatherers in the Cape Floristic Region (CFR) of South Africa. Research on USO richness, abundance, and energetic returns is largely confined to the south coast of the CFR. We extend this research to the west and southeast coasts by surveying 212 sites equally in the growing (spring) and dormant (autumn) seasons and across three biomes in all three regions. We quantify USO apparency (noticeability) to foragers based on phenological patterns of 131 edible USO species across CFR coastal lowlands. Apparency is seasonally constrained to cooler months in the strongly winter-rainfall west coast but less seasonal along the bimodal-rainfall south coast, and non-seasonal-rainfall east coast, providing longer periods for foraging. In all the surveyed regions, richness, abundance, and energetic returns of edible USOs peaked in winter/spring and were dominated by high-energy cormous species. On an annual basis, energetic returns were highest on the south coast, owing to USO apparency peaking in autumn, a feature absent at the other sites. In all regions, hotspots of USO energetic returns were rare, but most common on the south coast. Energetic returns were mostly higher in Strandveld than in Fynbos and Renosterveld. We discuss the implications of these findings for forager mobility in the three regions of the Cape coastal lowlands.

Geophytes, hunter-gatherers, Late Stone Age

Project WildfireSafe: towards improved fire management at the Wildlands Urban Interface

James Rodger

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Abstract

Wildfires are becoming more common and intense due to climate change, urban growth, and other land-use change. This poses increased risk for communities in the Wildland-Urban Interface (WUI), i.e. areas where wildlands meet towns and cities. Project WildfireSafe is developing practical advice and tools suited to local conditions to protect homes and communities in WUI areas in Norway and in the Fynbos Biome in South Africa. To do this, we are studying past wildfires and collecting data from ongoing prescribed burns. Specifically, we are studying influence of vegetation type, topography, weather, built structures countermeasures and mitigating measures on fire spread and burn characteristics, and ultimately hazard to humans, biodiversity and ecosystem functioning. Additionally, we are surveying existing WUI guidelines from other regions to evaluate their relevance for Norway and South Africa. For Norway and South Africa, this project will create and disseminate guidelines for conducting prescribed burns and recording and evaluating wildfires. This will contribute to the protection of lives and livelihoods, as well as biodiversity and ecosystem function, in the WUI.

Biological invasion; fire-return interval; anthropogenic influence

Methods for the Conservation of Cape Disas and Their Mycorrhizal Symbionts

AJ Rogerson

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Abstract

Orchid seeds can be challenging to germinate and culture into fully developed plants. Seeds can require mycorrhizal symbionts to germinate and symbiotic germination can result in more robust seedlings following deflasking. Cape terrestrial orchid species are disproportionately threatened and to conserve an orchid species, the associated mycorrhizae should also be conserved for future seed inoculation. Under isolated storage conditions, fungal isolates may lose their symbiotic capabilities over time.

To investigate the loss of symbiotic abilities, symbionts will be isolated from several threatened Cape Disa species. These mycorrhizae will either be stored in isolation or symbiosis with seedlings germinated by this fungus. Periodically, seeds will be sown and inoculated with either fungi stored in isolation or with fungi stored in symbiosis, and germination rates over time will be assessed.

orchid, fungal symbiont; in vitro

An examination of long-term ecological research and monitoring in South Africa with a particular focus on the Jonkershoek Valley

Jason Ross
University of the Western Cape

Abstract

There is a broad consensus on the need to harmonise, coordinate, and synthesise long-term biotic and abiotic data and information in order to facilitate comparisons across international monitoring activities. The International Long Term Ecological Research (ILTER) network is a global network to which the South African Environmental Observation Network (SAEON) belongs. While research and monitoring are ongoing at various sites across South Africa, it remains uncertain how well these activities align with global frameworks aimed at data harmonisation and capturing essential monitoring variables. This study aims to examine the long term ecological research and monitoring activities happening in South Africa by paying particular attention to the Jonkershoek Valley. First, a framework was constructed drawing from global monitoring frameworks that have been proposed worldwide seeking to capture essential variables for environmental monitoring. Second, this emergent framework was used to test against the monitoring activities happening at five long term ecological research sites in the country. Finally, at a local scale, past monitoring activities were investigated in the Jonkershoek Valley by assessing old historical monitoring data sheets. Our results reveal that grouping the essential environmental variables into a single framework proves to be exhaustive, with few sites practically being able to cover all variables. Cathedral Peak Research Catchments covers the majority of the essential variables across the five selected sites. The Jonkershoek Valley site hosts a rich array of historical monitoring data files with exhaustive sampling efforts conducted between 1960 and 1990. On this basis, it is recommended that long term sites in South Africa assess the strength of their research and monitoring by using global monitoring frameworks such as the one proposed in this study to enhance their national and global relevance.

long term ecological research, monitoring, variables, ecosystem, International Long Term Ecological Research (ILTER)

Quantifying impact and effectiveness of bark spot spray application of herbicide by helicopter on invasive alien pine trees and its collateral damage to indigenous vegetation

Deon Rossouw
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Abstract

The uncontrolled expansion of invasive alien plants (IAPs) constitutes one of the major threats to biodiversity in the Cape Floristic Region (CFR). Many natural (primarily mountainous) areas have inaccessible stands of IAPs that provide a continuous source of seed for invasions into uninvaded areas. The alien clearing method of direct Aerial Basal Bark Application (ABBA) of herbicide to the stem and apical buds of invasive alien pine trees (primarily Pinus contorta) has been successfully executed by the Department of Conservation in New Zealand. Currently, in the Western Cape Province, the rate of IAP control and management is not sufficient to reach the maintenance phase, therefore these innovative methods are of interest to conservation organisations as a new tool to combat alien species and reach adequate control measures to inhibit further infestation. As IAPs (particularly pines, Hakea, Australian Wattles and Gums) are an on-going and expanding threat to biodiversity and water security in South Africa, this method was investigated for use in the Western Cape Province. Research was done to assess the effectiveness of this method on Pinus pinaster and to determine the negative effects of the herbicide (Triclopyr Ester) on the indigenous vegetation (mountain fynbos) below and around the target trees. The average size of the area of indigenous vegetation affected by the herbicide below the pines was found to be 19.97 ± 15.18 m² (mean ± SD). This affected area is statistically small relative to the impact per hectare of leaving the pine trees standing. A herbicide ratio of as little as 30% was effective in killing the pine trees, with a 100% die-off after six months of trees sprayed using this method. The impact of the herbicide on the indigenous vegetation is sufficiently limited to make this a worthwhile alien extirpation method where appropriate Aerial Basal Bark Application (ABBA),

Fynbos, Helicopter, Herbicide, Indigenous Species, Invasive Alien Species,

Data, data everywhere, but when do these become valuable? The Outeniqua World Heritage Site case study

AnneLise Schutte-Vlok

CapeNature, Swartberg World Heritage Site Office, Queens Hotel Complex, Oudtshoorn 6620
**Natural Resource Science and Management Cluster, Faculty of Science, Nelson Mandela University, George 6530
***Garden Route Scientific Services, South African National Parks, Knysna 6570"

Abstract

An analysis of long-term datasets to assess the response of reseeding Protea spesies to the historical fire regime over a 54-year period in the Outeniqua World Heritage Site (OWHS) was recently completed. This study involved the longest comprehensive analysis of a fire regime in conjunction with the responses of slow-maturing plant species in a fynbos protected area to date. The results produced guidelines to inform future management of fire in the fynbos. Maturation rates and post-fire recruitment of proteoids at OWHS showed juvenile periods of 5–10 years; very good recruitment success after longer fire return intervals, warm-season fires, and larger fires. Over the past 54 years, the mean fire return interval seemed to have decreased, and larger areas have burnt during the cool season in later years. Measured against the responses of indicator species to fires, both these trends are reason for concern. Management interventions should focus on limiting cool season fires and limiting fires in young veld. Awareness raising among all relevant stakeholders of the impacts of inappropriate fire regimes is crucial. Fire records and database; Permanent Protea plot monitoring; Post-fire monitoring; management recommendations

Reigniting Resilience: The Role of Fire Management in Future-Proofing Fynbos

Matt Sephton
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Abstract

Fire is not only a natural process in Fynbos, it is a defining force. Yet across much of the Cape Floristic Region, the relationship between fire and landscape has become unbalanced. Suppressed in some places, poorly timed or unplanned in others, fire is increasingly either feared or misunderstood.

In this talk, Matt Sephton of Living Lands argues that proactive, well-managed fire is not only
ecologically necessary but economically sensible, especially in the context of invasive plant species, dwindling water supplies, and growing climate uncertainty.

Drawing on field experience, the presentation explores what successful fire management looks like in practice. It breaks down the real costs of prescribed burning (planning, preparation, coordination) and weighs them against the long-term benefits: healthier catchments, reduced wildfire risk, improved water yield, and enhanced biodiversity.

Importantly, the talk will outline the conditions required for fire management to succeed, from clear legislation and competent implementing agencies to landowner cooperation, skilled crews, careful coordination, and favourable weather. It will also challenge the perception that prescribed burning is too risky or too expensive to implement at scale.

To truly future-proof fynbos, we must restore its natural fire rhythm. That means moving beyond emergency response toward integrated, proactive fire regimes that work with, rather than against, the natural dynamics of the biome."

Fire management, prescribed burns, veld management, fynbos

Evaluating Seed Suppression by Biological Control Agents on Invasive Australian Acacias in Garden Route National Park

Thabang Sibiya

South African National Parks Scientific Services - Rondevlei P.O. Box 176 Sedgefield 6573

Abstract

Invasive Australian Acacia species pose a major threat to biodiversity and ecosystem processes in the Garden Route National Park. Their high seed output and long-lived soil seed banks make them particularly difficult to manage using conventional methods. Biological control, which targets seed production via gall-inducing agents, has shown promise elsewhere but has yet to be adopted in the park due to uncertainty about its local effectiveness. To assess whether biological control is effectively reducing Acacia reproductive capacity, we investigated three key questions: (1) Are galling agents reducing seed production at the individual tree level? (2) To what extent is seed rain suppressed in areas where agents are present? and (3) What is the current density and viability of the soil seed bank across infested sites? We focused on three Acacia species (A. mearnsii, A. longifolia, and A. stricta) and conducted field surveys at seven locations across the park. Seed rain was measured using seed traps, galling intensity was quantified on branches, and seed bank size and viability were assessed through soil sampling and germination trials. Preliminary results indicate high galling intensity for A. mearnsii (93%), moderate for A. longifolia (44%), and low for A. stricta (10%). These findings suggest that biological control is contributing to seed suppression and should be reconsidered as part of an integrated management strategy. In areas where seed production has been substantially reduced, managers may consider delaying clearing operations to prioritise species or sites where biocontrol is less effective. This evidence-based approach can help optimise limited resources and improve long-term management outcomes.

Acacia invasion, biological control, Integrated weed management

Bridging the knowledge gaps in fynbos: A call for scientific engagement in SANParks

Thabang Sibiya

Scientific Services, South African National Parks, Knysna, South Africa

Abstract

Protected areas are increasingly recognised not only as biodiversity hotspots, but also as platforms for advancing ecological science and conservation management. They serve as living laboratories for studying ecosystems, species interactions, ecosystem services, and drivers of change. Although well protected, many fynbos areas outside the south-west remain underrepresented in ecological research, offering unique opportunities to address pressing conservation questions. These gaps are particularly evident in the eastern CFR and arid fynbos regions, including the fynbos–Nama Karoo ecotone, where research on post-disturbance recovery, invasive species dynamics, and fire–vegetation interactions remains limited. Without locally relevant data, it is difficult to assess whether current restoration and fire regimes are achieving desired ecological outcomes. Addressing these gaps is not only a scientific priority but a management necessity. For SANParks to respond effectively to ecosystem change and improve restoration outcomes in these transitional landscapes, it must draw on applied ecological knowledge generated through strategic partnerships. These under-studied landscapes offer rich opportunities for field-based ecological research that informs fire regimes, restoration planning, and long-term vegetation change. The aim of this talk is to highlight knowledge gaps and explore how scientific partnerships can help address these gaps through applied research in ecotonal fynbos systems. Collaborating with the broader scientific community is essential to generate the knowledge needed to inform adaptive management and strengthen the long-term resilience of fynbos ecosystems.

Fynbos, Eastern CFR, Arid fynbos, Adaptive management, Protected areas

Strengthening Environmental Decision-Making: The Role of Spatial Planning and Ecological Infrastructure in EIAs

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Abstract

The Western Cape, and particularly the Garden Route region, is experiencing a rapid increase in development pressure, posing serious threats to biodiversity and water security. Despite the availability of key planning resources such as the Western Cape Biodiversity Spatial Plan (WCBSP) and the Fynbos Forum Ecosystem Guidelines, these tools are often underutilized by Environmental Assessment Practitioners (EAPs) and specialists during the assessment process. This results in assessments that fail to adequately account for ecological sensitivity, cumulative impacts, and long-term sustainability. The Garden Route contains fragmented remnants of critically endangered fynbos vegetation, and through informed planning using the WCBSP, there is an opportunity to proactively link ecological corridors, improving conservation outcomes. Additionally, strategic water source areas, which is South Africa's most important ecological infrastructure, are not consistently considered in development applications—despite the country's water-scarce status. This paper highlights concerning trends in environmental assessment practice and emphasizes the urgent need for better integration of biodiversity planning tools into land-use decisions. It is particularly relevant for policy makers, municipal officials, and competent authorities, who play a central role in ensuring that development is ecologically sustainable and informed by best available science. A more integrated approach is essential to ensure that land-use planning in biodiversity-rich areas balances development needs with long-term ecological resilience.

Biodiversity Planning, Ecological Infrastructure, Environmental Impact Assessments

Ranking of Cape geophytes based on proxies for the benefits and costs of harvesting their underground storage organs

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Abstract

The Cape Floristic Region (CFR) has the world's highest diversity of plants with underground storage organs (USOs). It has been hypothesized that the CFR's rich USO-bearing flora contributed to sustaining populations of modern humans during the Late Pleistocene. Here we quantified, for 130 species of Cape geophytes, proxies for the energetic benefits (USO size and nutrient content) and costs (USO depth and fibre and tannin (antinutrient) content) of their USOs, and rank them according to their likely attractiveness to foragers We identified six USO types, which we ranked according to potential returns to foragers as follows. Small and big cormous USOs (53.8% of the 130 species) provide the highest energetic benefits of all USO types while incurring only modest harvesting and processing costs. Bulbs (15.4%) are easy to harvest and require little preparation with moderate energy content. Small and big rhizomes (12.3%) have modest energy content and, especially for big ones, are often fibrous and tannin-rich. Tubers (18.5%) have low energy content, but could have been highly ranked as thirst quenchers. The archaeological and ethnographic data on USO use by Cape hunter-gatherers are consistent with our ranking. The abundance of edible, cormous geophytes of the CFR is unique globally.

Geophytes; Late Pleistocene; Carbohydrate sources; Energetic returns; Hunter-gatherer diets

Enhancing the Cultivation and Protection of Rare and Endangered Bulbous Geophytes (Babiana pygmaea and Gladiolus spp.) Against Fusarium spp. Infestation Using Fungal Endophyte

Clara Sitoe

Cape Peninsula University of Technology

Abstract

Fusarium spp. are soil-borne pathogens that cause significant losses in geophyte cultivation, particularly affecting species such as Babiana pygmaea and Gladiolus spp., which are integral to the biodiversity of the Cape Floristic Region (CFR). Traditional control using synthetic fungicides has limited sustainability due to costs, environmental concerns, and the development of resistance. Fungal endophytes, which are non-pathogenic microbes residing within plant tissues, offer a promising alternative through mechanisms such as pathogen inhibition, systemic resistance induction, and growth promotion. Despite their potential, the diversity and biocontrol capabilities of fungal endophytes associated with South African geophytes remain poorly explored. This study aims to isolate and characterize fungal endophytes from healthy Babiana and Gladiolus specimens and evaluate their antagonistic activity against Fusarium spp. isolated from infected plants and soils. Through dual culture assays and greenhouse trials, we assess the potential of these endophytes to reduce disease severity and improve plant health. The findings are expected to inform sustainable disease management strategies and support the ex-situ conservation of threatened geophytes, contributing to biodiversity preservation and more resilient horticultural practices in the CFR.

Fungal endophytes, Fusarium wilt, Geophyte conservation

Investigating ecosystem degradation in the Cape Floristic Region using hyperspectral imagery from BioSCape

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Abstract

Ecosystem degradation is the deterioration of ecosystems from stressors such that species richness and/or ecosystem services and functioning is compromised. For ecosystem threat assessments to more accurately represent the state of our ecosystems, and better inform policy and management, there is great need for spatially explicit measures of ecosystem degradation to complement existing measures of complete habitat loss. Imaging spectroscopy, a relatively recent advance of remote sensing, could allow researchers to detect nuanced patterns of ecosystem degradation by analysing differences in biodiversity and plant chemical or morphometric traits across habitats. The Biodiversity Survey of the Cape (BioSCape) collected high spatial resolution airborne imaging spectroscopy data across large parts of the Cape Floristic Region (CFR) in November 2023. These data provide an opportunity to investigate differences in plant traits, community composition or spectral diversity between secondary natural vegetation, having recovered from dense stands of alien invasive plant species (IAPS) or exotic plantations, and neighbouring pristine communities. To identify whether a specific set of variables could be used to detect ecosystem degradation at large spatial scales across the CFR, I am performing a meta-analysis of published literature on IAPS legacy impacts and passive restoration of CFR ecosystems. I then plan to use these variables to inform and test predictions of how secondary and natural communities should differ at the large spatial scales covered by the BioSCape imagery.Imaging spectroscopy, ecosystem degradation

Strengthening Invasive Alien Animal Management in the Cape Floristic Region: Updates from the Invasive Alien Animal Working Group

Andrew Turner
Cape Floristic Region Partnership

Abstract

The Invasive Alien Animal Working Group (IAAWG), operating under the Cape Floristic Region Partnership (CFRP), continues to play a critical role in coordinating invasive animal management across the region. This update, presented at the 2025 Fynbos Forum, outlines key developments, challenges, and collaborative efforts since the last engagement. The group has prioritized risk assessments for several emerging species, including Sambar Deer and invasive fish, and is actively exploring innovative control methods such as thermal drones and automated trapping systems.

Significant progress has been made in managing species such as House Crows, Guttural Toads, and PSHB, with notable contributions from the City of Cape Town and SANParks. However, challenges persist, including limited funding, community resistance to control measures, and the need for improved data on species impacts. The group also emphasized the importance of integrating research, such as collaborations with academic institutions, and highlighted the need for sustained funding and policy support.

The IAAWG continues to advocate for a more resilient and coordinated approach to invasive animal management, recognizing the unique biodiversity of the Cape Floristic Region and the importance of cross-sectoral collaboration. This presentation will also reflect on the value of working groups in fostering knowledge exchange, aligning priorities, and supporting evidence-based decision-making across landscapes.

Cape Floristic Region, Invasive Alien Animals; Biodiversity Management; Risk Assessment; Collaborative Conservation

Best Practices for Integrated Fire and Invasive Alien Clearing across the Cape Floristic Region

Andrew Turner
Cape Floristic Region Partnership

Abstract

This workshop will explore best practices for integrating fire management and invasive alien plant control across the Cape Floristic Region (CFR), with a focus on collaborative approaches, shared learning, and actionable outcomes. As fire and invasive species increasingly threaten the ecological integrity and resilience of the CFR, there is a growing need for coordinated, cross-sectoral responses that are informed by both science and practice.

The session will begin with insights from the Greater Cape Town Water Fund, highlighting lessons learned from integrated fire and invasive species management. Participants will engage in group discussions to identify key challenges, opportunities, and practical solutions—particularly around proactive fire management and post-fire treatment. Case studies will be presented to demonstrate how research has successfully informed on-the-ground interventions, while also identifying critical knowledge gaps that require further investigation.

The workshop will also feature contributions from the Cape Winelands District Municipality and the Greater Overberg Fire Protection Association (GoFPA), who will share advocacy strategies and tools for mobilizing support and resources. A key focus will be on what can be achieved through existing resources and collective action, with examples of successful partnerships.

The session will conclude with an expert panel discussion to synthesize key takeaways and outline clear, actionable steps forward. Outputs from the workshop will be captured in accessible formats to support uptake by practitioners, policymakers, and partners across the region.

Integrated Fire Management, Invasive Alien Species, Cape Floristic Region, Advocacy, Funding Mechanisms, Research Gaps, Collaborative Efforts.

BioControl - challenges and opportunities for better management

Andrew Turner

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Abstract

Biocontrol is very often a foundational part of integrated pest management. Biocontrol in the form of predators and pathogens has a long history in South Africa with some good success stories. Despite this, there are some significant challenges in improving the effectiveness and spread of these agents as well as the support required to produce biocontrol agents and research and test new agents. This workshop will address some of these issues with the aim of finding solutions, even if short-term and phased or for local take up with the long-term goal of sufficient spatial coverage.

Biocontrol, Invasive Alien Plants, challenges, funding

Impact of flowering species richness, Shannon diversity index and seasonality on anthophilous insects within the Southern Cape Fynbos

Graham van Bergen

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NVT, Nature's Valley, 388 Lagoon Drive, 6600"

Abstract

Insects are the dominant pollinators within the Cape Floristic Region, a global biodiversity hotspot. Yet, their interactions with flowering plants remain poorly studied at the ecosystem level. Pollinating insect diversity can be influenced by flowering plant species richness and abundance (resource availability), with inherent spatiotemporal variability. The aim of this study is to determine which environmental factors (flowering species richness, Shannon diversity index and seasonality) drive the diversity patterns of anthophilous insects within southern Cape mountain fynbos. Ten fynbos sites were sampled with elevated pan traps (n = 100) over two seasons, spring and summer. A total of 551 species of insects and 61 971 individuals were recorded. The species richness of Diptera and Hymenoptera was correlated with flowering species richness (positive) and Shannon diversity index (negative), with higher species richness in summer. Coleoptera species richness showed no correlation with Shannon diversity index, while positively correlating to flowering species richness, and higher richness in summer. In relation to insect abundances, Diptera showed no correlation to any of the environmental factors. Coleoptera abundances correlated with flowering species richness (positive) and Shannon diversity index (negative), and more abundant in spring. Hymenoptera showed no correlation to flowering species richness, despite a significant correlation to Shannon diversity index (negative), while more abundant in summer. We show that the major anthophilous insect orders respond differently to aspects of flowering plant diversity and season, highlighting the importance of multitaxon studies in complex and diverse ecosystems.

Anthophilous, Cape floristic region, environmental factors

The Contribution of Hydric Habitats to the Richness of the Fynbos Flora

Justin van Blerk
University of Cape Town

Abstract

Aim: The Cape Fold Belt Mountains, underlying the Cape fynbos flora, facilitate widespread moisture collection and groundwater availability across the region, with importance for maintaining hydric habitat niches. We assessed the contribution of hydric habitat-associated species (HH species) to the richness of this flora, and how this varies phylogenetically and spatially.

Methods: We compiled data describing habitat preference and distributions for 3114 species in 23 fynbos clades. We used published habitat descriptions to identify putative HH species and tested how hydric habitat association is structured phylogenetically using both Ornstein-Uhlenbeck models and measures of phylogenetic signal. We used species' distribution data to identify regional hotspots of HH species and boosted regression trees (BRTs) to identify associated environmental drivers.

Results: Preference for hydric habitats is associated with nearly a fifth of the species in our study, being most strongly represented in monocot clades. HH species are most strongly concentrated in the southwestern CFR, where they contribute to high overall richness. BRTs indicated that hotspots of HH species are generally associated with saturating, winter precipitation and/or elevated levels of groundwater discharge.

Main Conclusions: Our findings indicate that the unique climate, topography and hydrology of the CFR facilitate the formation and maintenance of important hydric habitats, which play host to a large fraction of the flora despite much of the region being semi-or seasonally arid. These findings highlight the threat of climate change and underscore the need for extreme caution regarding activities like groundwater abstraction, which could disrupt the hydrological processes essential to sustaining these habitats and their unique flora.

groundwater, wetlands, diversity, refugia

The Cape Flats Nature Reserve: future-proofing fynbos through education, awareness and community engagement within an urban context

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Abstract

Nature reserves play a critical role in safeguarding threatened ecosystems within urban landscapes, while offering opportunities for environmental stewardship. The Cape Flats Nature Reserve (CFNR), a 34-hectare reserve owned and managed by the University of the Western Cape (UWC), serves as an ecological haven for the endangered Cape Flats Dune Strandveld and critically endangered Cape Flats Sand Fynbos amidst urban development.

The CFNR is an accessible space for research, teaching and student engagement. As a living laboratory, it supports interdisciplinary collaboration across faculties, enabling broad-based environmental education and awareness through its role as an outdoor classroom. Its annual Biodiversity Survey was initiated as a field training opportunity for students. Over time, it evolved into a multidisciplinary conservation education platform involving students, academic staff, field experts and public participants. This inclusive and collaborative model enhances student learning by strengthening community engagement and fostering a deeper understanding of biodiversity and ecosystem dynamics

Annual biodiversity practicals enable students to clear alien vegetation within designated areas, coupled with long-term monitoring of its density over time. This led to the establishment of an active volunteer programme focusing on skills training.

Partnerships with the South African Education Programme (SAEP) and Zeitz MOCAA's BMW Centre for Art Education, facilitate access to learners from less privileged schools for environmental education and career guidance.

The CFNR’s nursery encourages indigenous planting, thereby extending conservation into private gardens. Guided walks encourage a deeper connection with nature, cultivating environmental awareness and appreciation for the reserve as a recreational and educational space.

Environmental Education, Community Engagement, Outreach Greening, Urban Conservation

When Future-Proofing Fails: The Case of Elandsfontein and the Limits of Biodiversity Safeguards

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Abstract

Despite the global acclaim of South Africa's biodiversity planning tools – including Critical Biodiversity Areas, Environmental Management Frameworks, Protected Area Expansion Strategies, and Biosphere Reserves – the Elandsfontein phosphate mine was authorised within the Elandsfontein Aquifer situated in one of the most ecologically sensitive and hydrologically connected regions in the Western Cape. Located in a buffer zone of the West Coast National Park and feeding the Langebaan Lagoon Ramsar site, this site was earmarked for World Heritage nomination, and yet mining commenced in 2015 without a full EIA, in direct contradiction of national policy, legal review processes, and public opposition. The phosphate mine has also succeeded in having its offset agreement set aside and has applied for part of the West Coast National Park to be deproclaimed. This paper provides a critical case study of governance breakdown, policy bypass, and regulatory failure, drawing on original documents, spatial plans, and stakeholder records. It challenges the prevailing assumption that the existence of planning tools equates to effective protection, and proposes urgent reform to embed legal enforceability, ecological thresholds, and public oversight into conservation frameworks.

Governance, Conservation, Offset, Biodiversity, Elandsfontein Aquifer, Elandsfontein, Critical Biodiversity Areas

Why carrying on with status quo of assessing weed biocontrol is a waste of time

RUAN VELDTMAN

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3. Academy for Environmental Leadership SA, Upington"

Abstract

The biological control of weeds is seen as an important management tool to ensure conservation of biodiversity. In South Africa the existing weed biocontrol programs are lauded as successful and an essential action to deal with plant invasions nationally. There is however a recent body of work and line of argument that questions the dogma that biological control is always worth considering, and better than the alternative of not using biocontrol. Using the much-researched biological control program on Australian Acacias using seed-feeding agents, we illustrate the weak scientific base for claiming success of biological control agents in suppressing these species. This case study is also an example of how non-target interactions higher than the plant level are not considered during agent selection. The null hypothesis that biocontrol does not exert significant control on the target weed is never tested. Instead, there is an over reliance on expert opinion and benefit of experience, with scant pre-release data collection (although this would provide the strongest and most scientifically sound base for assessment). The current scientific debate whether biological control significantly reduces the impact of their target hosts is highly relevant because weed biocontrol is now also promoted as a preventative management method. We contend that the status quo of assessing weed biocontrol requires urgent reform. Investment in experimentally sound data collection, before and after release, is required to prove that classical biological control agents result in a significant reduction of the impact of their invasive plant hosts.

Acacia spp., Trichilogaster spp., Uromycladium morrisii, Melanterius spp.

Challenges and successes in developing new Fynbos plantings at the Garden Route Botanic Garden.

Christiaan Viljoen

Garden Route Botanical Garden & The Southern Cape Herbarium 49 Caledon Street, Camphersdrift, George, 6529.

Abstract

Botanic gardens can often be an excellent repository for rare and endangered species when established successfully.

The Garden Route Botanic Garden is a young, popular botanic garden with enormous potential. Developing permanent fynbos plantings representative of the Outeniqua region has been planned for quite a while.

Implementing this has been a challenge. Although unconventional methods have been applied, successes are beginning to be apparent.

A short review of methods and results should be useful for other possible projects of similar nature.

Botanic garden, repository, Outeniqua, fynbos,

Diverging Sex Ratios in Dioecious Proteaceae are a Consequence of Anthropogenic Disruptions to the Fire Cycle.

Sarah Visser
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Abstract

Background and Aims: Sex ratios in dioecious plant species often deviate from the expected 1:1 male-to-female ratio due to differential survival rates. Such deviations have been used as proxies for assessing reproductive costs in plants. In the fire-prone Fynbos biome, previous studies on sex ratios and reproductive costs in dioecious Proteaceae have produced conflicting results, warranting further investigation. We aimed to examined whether dioecious Proteaceae, specifically Leucadendron and Aulax, experience higher reproductive cost in males, females or both equally.
•Methods: We analysed sex ratios across populations of varying ages and assessed individual health through canopy cover scores. In addition, we conducted nutrient analysis to quantify allocation to vegetative versus reproductive structures.
•Key Results: Populations were consistently more male-biased (mean sex ratio = 0.59), with the degree of bias increasing with population age. The Bayesian random slope model predictions indicated that a 30-year-old population, would have a sex ratio of 0.66 (95% CI, [0.52, 0.78]), meaning that there would be 1.9 times more males than females. In older, more male-biased populations, females exhibited lower health scores. The nutrient analysis showed that while total nutrient content did not differ between the sexes, females allocated a greater proportion of total nutrients to their reproductive cone structures.
•Conclusions: Our results suggest that females exhibit higher reproductive costs which contribute to increased female mortality over time, resulting in male-biased sex ratios in older populations. Anthropogenic fire suppression contributes to this trend by allowing populations to survive beyond their normal fire-return interval for the Fynbos biome. These altered population dynamics could have far-reaching consequences for overall population viability and ecosystem stability in fire-adapted ecosystems like the fynbos.

dioecious, diverging sex ratios, fire suppression

Is the Swartberg Complex World Heritage Site in an upswing or downswing?

AnneLise Vlok

CapeNature, Swartberg World Heritage Site Office, Queens Hotel Complex, Oudtshoorn; CapeNature, George Regional Office, York Park Building, George

Abstract

A 10-year protected area management plan for the Swartberg Complex World Heritage Site and Nature Reserves (SWCWHS&NR) was completed and approved by the MEC in 2020. When the management plan was developed in 2019, five focal values were recognised to represent the full suite of biodiversity and cultural historic heritage in the SCWHS&NR.

These include the Fynbos mosaics, Succulent Karoo and Subtropical Thicket mosaics, Freshwater ecosystems, Cape mountain zebra and Heritage Resources and Rural Landscapes.

The threats to each of these focal values were identified and prioritised. Goals, objectives, actions and strategies to alleviate the threats were formulated and captured in the Strategic Implementation Framework table.

As we are now halfway through the implementation of the plan it is an appropriate time to analyse, evaluate and determine if we need to adapt our strategies and actions. The results of the assessment will be presented and discussed.

Open Standards for Conservation Practice, viability assessment, monitoring and evaluation framework, partnerships

The Gall Rust Fungus on Stinkbean is now well established and dispersing naturally in South Africa.

Alan Wood

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Abstract

Stinkbean (Paraserianthes lophantha) (Fabaceae) is a widespread weed throughout the Fynbos of the Western Cape and parts of the Eastern Cape, though seldom forming large dense stands. Following a survey in Australia in 2006, the Stinkbean Gall Rust Fungus (Uromycladium woodii) was identified as the most promising potential biological control agent. Host specificity testing was carried out in the pathogen quarantine facility at ARC-PHP Stellenbosch campus, and permission to release was obtained in November 2015. The first releases were made in the winter of 2016, with releases continuing until 2021. Establishment has been confirmed at 20 sites where releases were made. The gall rust established readily at most sites, spreading rapidly from the point of establishment to throughout the weed stands usually within two or three years. For all but 3 stands, high levels of mortality occurred within four years of establishment of the gall rust, with there now being many stands with 100% mortality.

Uromycladium woodii has dispersed naturally and has infected plants in additional stands of Stinkbean. The locality of all stands where the gall rust was deliberately established, stands observed to have infections but where it was not established, as well as records available on iNaturalist, were obtained. The minimum distances between stands where the gall rust was established to stands to which the gall rust dispersed naturally were calculated. The furthest minimum distance for natural dispersal is over 100 km (from Eden municipality to Humansdorp, Eastern cape), with other distances being between 2 and 50 km (mean 22.8 km ± s.e. 4.25, n = 18). This biological control agent can now be considered to be well established and highly destructive to its host plant in South Africa.

Paraserianthes lophantha, Uromycladium woodii, Biological control