



Photo for WWF Report [8]

**WORLDWIDE**  *fruit*

**Case Study 2:**

**A South African Water Roadmap Case Study  
on the**

**Koue Bokkeveld**

**– Olifants & Doring River Catchment**

# Case Study 2: A South African Water Roadmap Case Study on the Koue Bokkeveld – Olifants & Doring River Catchment

## Context

Water, the lifeblood of our planet, sustains ecosystems, agriculture, and human societies. However, this finite resource faces unprecedented pressure globally. Agriculture, consuming 70% of freshwater withdrawals, is a major driver of water stress and biodiversity decline. Projections indicate a potential 40% shortfall between freshwater demand and supply by 2030, posing significant risks to global food security, economic stability, and environmental health <sup>[1]</sup>.

South Africa exemplifies these challenges. As a nation reliant on its agricultural sector – a key supplier of high-value fruit like citrus, apples, grapes, and stone fruit to markets including the UK <sup>[2]</sup> – it confronts escalating water insecurity. Factors such as recurrent droughts exacerbated by climate change, naturally arid conditions, and growing demand place immense strain on water resources. The Western Cape province, home to critical agricultural catchments like Groenlandberg, Koue Bokkeveld, and Hex & Wolseley, is particularly significant. Water security in these sourcing regions for **Worldwide Fruit Limited** (WFL) is influenced by factors such as fluctuating water availability, managing water quality, and adapting to more frequent extreme weather events like floods and droughts. Without proactive, collaborative intervention, these pressures threaten the long-term viability of farming communities, the resilience of supply chains, and the integrity of unique ecosystems.

Recognising the interconnectedness of environmental health and business resilience, WFL is deeply committed to responsible water stewardship. As a signatory to the **UK Food and Drink Pact** (Courtauld Commitment 2030) – a UK-based initiative driving sustainability across the food system – WFL is part of a collective effort targeting reductions in greenhouse gas emissions, food waste, and water stress. Addressing the water targets within this Pact requires focused action, particularly in international supply chains. This is where **WRAP's Water Roadmap** plays a crucial role, providing a framework specifically aimed at improving water security in key sourcing areas for the UK food and drink industry.

WFL's commitment translates into action in South Africa through collaboration with **WWF South Africa**. WWF-SA is a central partner in implementing the Water Roadmap's objectives in the Western Cape, leading projects in the priority fruit-growing catchments from which WFL sources. Furthermore, WWF-SA is instrumental in broader initiatives like the **Western Cape Collective Action Project**, providing governance support, expertise, and facilitating the collaborative conservation and rehabilitation efforts essential for long-term water security in the region. Through this multi-layered partnership structure, WFL supports a two-tiered strategy: promoting best practices at the farm level (efficient irrigation, soil health) and strengthening catchment-level governance (balancing agricultural, community, and ecological water needs).

This second case study in a series of three explores collaborative efforts within the **Koue Bokkeveld – Olifants & Doring River Catchment** focusing on the practical actions driven by the UK Food and Drink Pact and WRAP's Water Roadmap. It highlights the pivotal implementation role of WWF South Africa and illustrates how the initiative is advancing water security and ecological resilience in one of South Africa's key agricultural regions. Select examples from WFL suppliers and their growers help to illustrate how growers are aligning with and contributing to these broader efforts.

### **South African Water Roadmap Case Studies:**

- Case Study 1: A South African Water Roadmap Case Study on the Groenlandberg – Palmiet River Catchment
- **Case Study 2: A South African Water Roadmap Case Study on the Koue Bokkeveld – Olifants & Doring River Catchment**
- Case Study 3: A South African Water Roadmap Case Study on the Hex & Wolseley – Hex & Breede River Catchment



Report compiled by **Malissa Murphy**  
**Blue North Sustainability**

# Contents & Overview

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## 1. THE KOUE BOKKEVELD CATCHMENT

The Koue Bokkeveld is a key agricultural and ecological region in the Western Cape, producing export fruit like WFL's apples and pears for the UK. As the source of the Doring River, it also supports rare freshwater species. Water scarcity, invasive plants, and extreme weather events pose risks, making it a priority area for WWF South Africa under WRAP's Water Roadmap.

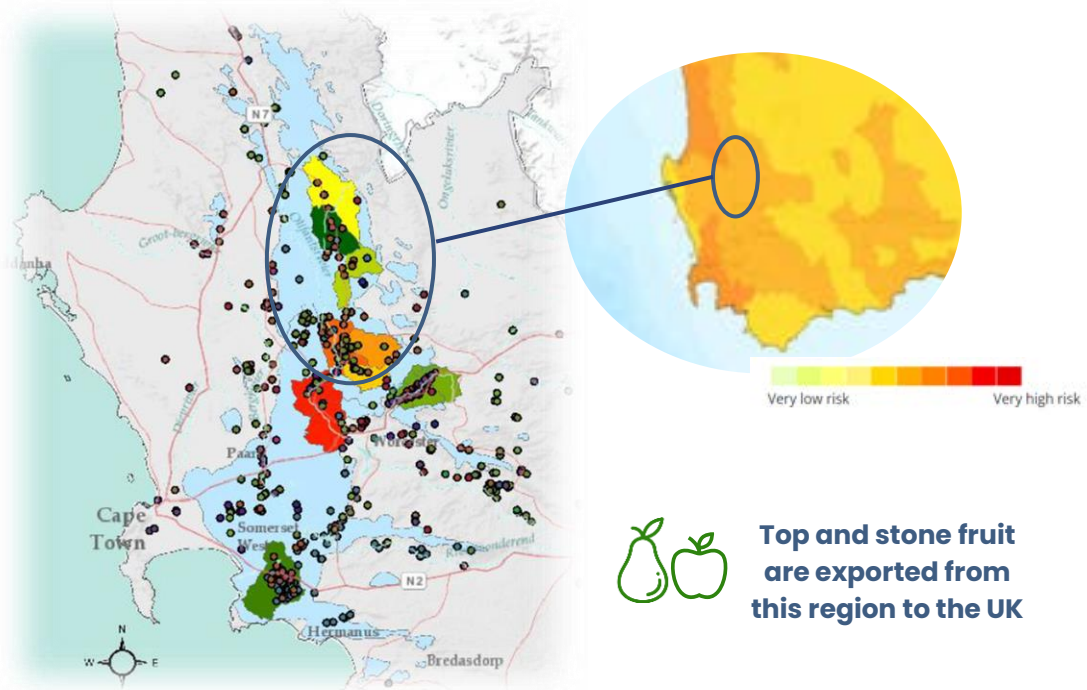
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## 2. COLLECTIVE ACTION IN MOTION

In the Koue Bokkeveld, **WWF South Africa** is spearheading collaborative efforts through the Water Roadmap to tackle complex water challenges, alongside WFL suppliers and their growers, the local Water User Association, and conservation bodies. Together, they are driving impactful interventions—from **piloting catchment-level water governance tools and clearing invasive species, to conserving endangered species and modernising on-farm water stewardship**. These locally grounded actions not only protect biodiversity and improve water use efficiency but also contribute to long-term catchment resilience through collective, multi-stakeholder coordination.



**WWF SA leads the on-ground Water Roadmap work.**



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## 3. NAVIGATING THE CHALLENGES OF COLLECTIVE WATER MANAGEMENT

Despite steady collaboration, catchment management in the Koue Bokkeveld continues to navigate challenges such as **flood-related infrastructure damage**, budget pressures, and limited technical capacity. WFL suppliers note the value of additional **government support** to sustain on-farm stewardship efforts and highlight the potential of enhanced monitoring and shared expertise to strengthen long-term water management.

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## 4. CONCLUSION & FUTURE OUTLOOK

The Koue Bokkeveld case study showcases how collective action—led by WWF South Africa and supported by WFL and its suppliers—is delivering tangible **progress in water stewardship, invasive species control, and biodiversity protection**. Looking ahead, scaling these efforts, enhancing monitoring, and strengthening collaboration remain key to building climate resilience and securing long-term water sustainability.

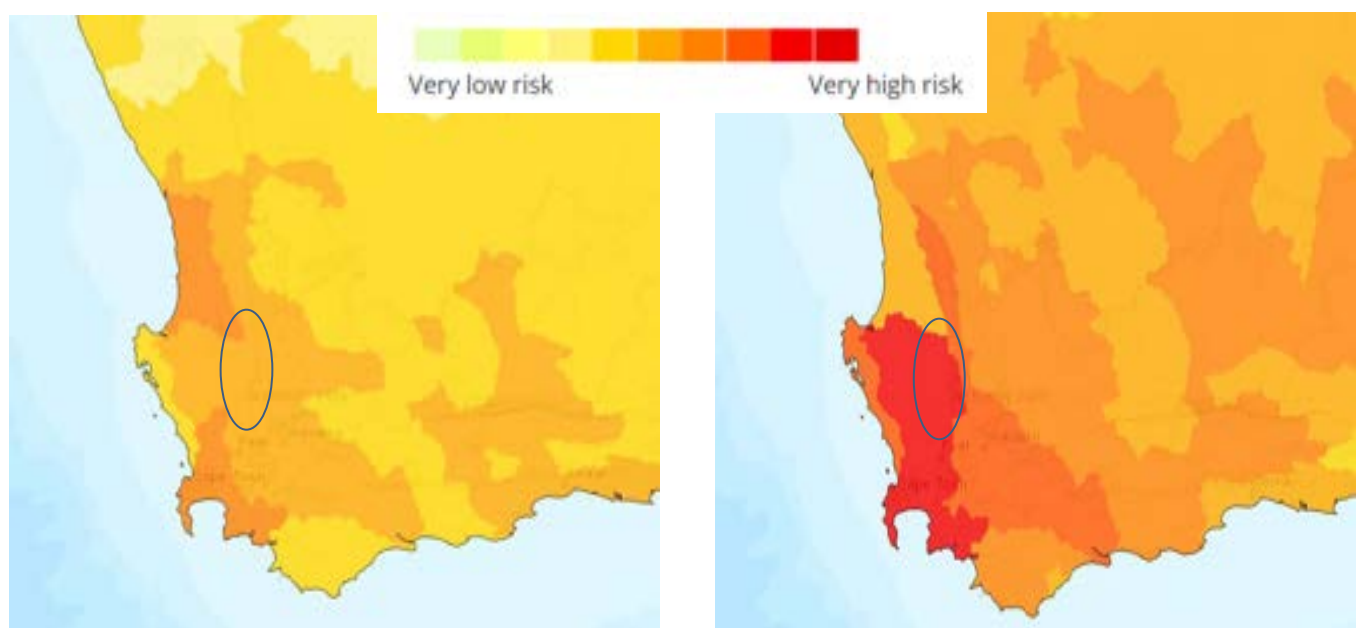
# 1. The Koue Bokkeveld Catchment

Situated at the southern tip of the Olifants–Doring Water Management Area (WMA), the Koue Bokkeveld is a critical agricultural and ecological hub in the Western Cape<sup>[5]</sup>. Nestled between the Cederberg and Skurweberge mountains, this high-altitude region features cold winters and crisp summers<sup>[5]</sup>. It forms the headwaters of the Doring River, a major tributary of the Olifants River, which together sustain ecosystems and communities across a vast area before flowing into the Atlantic Ocean<sup>[5]</sup>.

The Koue Bokkeveld is renowned for producing deciduous export fruit, vegetables, and wine grapes, making it one of South Africa’s premier agricultural zones<sup>[6]</sup>. Agriculture accounts for nearly 21% of registered surface water use in the Olifants–Doring WMA, with deciduous fruit alone constituting 98% of this use<sup>[6]</sup>. Irrigation relies heavily on rivers and farm dams, supplemented by groundwater, especially during dry summer months<sup>[6]</sup>. Notably, WFL sources top and stone fruit from this region for export to the UK, further highlighting the global significance of sustainable water stewardship in the area.

Ecologically, the Olifants–Doring catchment is exceptionally rich, boasting the highest proportion of endemic freshwater fish species in South Africa<sup>[7]</sup>. The Twee River sub-catchment is particularly vital, supporting the critically endangered Twee River Redfin, found nowhere else on Earth<sup>[7]</sup>. However, invasive alien species, agricultural runoff, and excessive water abstraction pose serious threats to these fragile ecosystems<sup>[7]</sup>.

In addition to its agricultural and ecological value, the [WWF’s Water Risk Filter](#) identifies several key challenges for this landscape - including water scarcity, pollution, habitat change, and increasing climate variability - highlighting the urgency of targeted action to safeguard water availability and ecological function.



Current physical risk (left) and expected risk in 2030 (right) for the Koue Bokkeveld catchment (circled), according to the WWF Water Risk Filter.

Clearing just **1 hectare** of invasive species in South Africa can save between **800 and 34,000 litres of water per day**, depending on the species and location. In catchments fully infested with mature invasive trees, streamflow can increase by **15–29.5%**—highlighting the substantial water gains possible when these efforts are scaled across larger areas <sup>[9,10]</sup>.



Scan to learn more about WRAP's Water Roadmap Project in South Africa.

Photo by Carina Wessels

## 2. Collective Action in Motion

In response, the Koue Bokkeveld has become a focal area for WRAP's Water Roadmap, with WWF South Africa leading collaborative efforts to address these risks on the ground. Tackling the region's complex water challenges demands close cooperation across stakeholders.

WWF-SA coordinates and implements large-scale conservation and water management interventions, working in partnership with growers (including WFL suppliers Stargrow, Du Toit, Core Fruit, Ceres Fruit Growers, Doornkraal Agri, and De Keur), water user associations like the Koue Bokkeveld WUA, and local conservation bodies.

Together, this network aims to secure long-term water resources and protect biodiversity. WFL supports supplier participation and contributes resources through the Water Roadmap. Suppliers and their growers implement sustainable practices, contribute local knowledge, and carry out independent conservation activities, while the WUA plays a key role in piloting tools and facilitating local coordination. This multi-stakeholder approach is vital to enabling meaningful and lasting impact at the catchment scale.

These collaborative efforts are already yielding tangible results through a mix of coordinated catchment-wide strategies and dedicated on-farm stewardship:



The Twee River supports the critically endangered Twee River Redfin, found nowhere else on Earth<sup>[7]</sup>.

Photo by Fynbos Fish Species

## Catchment-Wide Governance and Planning

WWF is collaborating with partners like the Freshwater Research Centre and Institute for Water Research (IWR) to strengthen governance. A key output is the Water Balance Tool, piloted with the Koue Bokkeveld WUA. This spreadsheet-based system aims to improve water use efficiency at a catchment scale, supporting both daily farm operations and long-term planning. The pilot programs are showing promise, and scaling up is a priority dependent on funding.

## Invasive Species Removal

The Water Roadmap project, managed by WWF SA, has cleared invasive plant species across 55 hectares<sup>[4,8]</sup> of priority river systems over the past four years. This enhances water availability and restores critical riparian habitats. WWF's efforts focus on species like Black Wattle, Port Jackson, and Weeping Willow<sup>[3]</sup>, tackling a major threat identified in areas like the Twee River region, where invasives decrease water runoff, destroy habitats, and increase fire and flood risks.

Beyond WWF projects, WFL suppliers and their growers undertake significant clearing. Rietfontein cleared 15 ha of Blue Gum and 15 ha of Pine, planting 100 indigenous Cape Willows and planning further clearing for mulching. Doornkraal Agri actively removes Beefwood, Red Eye, Black Wattle, Port Jackson, and Weeping Willow across their farm and engaged in Visgat River restoration (2020–2023), removing Black Wattle to control erosion. Kunje Farm regularly removes new invasive plants following earlier WWF clearing and uses chipped invasives and pruning twigs as mulch.

## Species Conservation and Awareness

WWF facilitates partnerships with CapeNature, the South African Institute for Aquatic Biodiversity, and local growers to conserve the critically endangered Twee River redfin<sup>[7]</sup>. This includes establishing refuge populations in farm dams and raising awareness through initiatives like the short film [Waterdak](#), which highlights the link between farming and freshwater ecosystems.

## Biodiversity Stewardship

WWF works with initiatives like the Twee Rivieren Nature Reserve, conducting biodiversity assessments on multiple farms to advance species monitoring and conservation, including using camera traps to document wildlife like Cape leopards.

## On-Farm Stewardship

Leading by example, WFL suppliers and their growers are implementing these innovative solutions to maximise water use efficiency:

- **Irrigation Optimisation:** Adopting efficient drip and micro-irrigation, reducing micro-spitter radius, paired with real-time scheduling and soil moisture monitoring. Kunje Farm adapted to drought by cutting back irrigation times, irrigating less per block, and shifting to night irrigation. "We managed things as best as we could," stated Kunje Farm.
- **Soil Health Improvements:** Using cover crops, wheat straw, and mulching (often from chipped invasives) enhances water retention. Kunje Farm allows weeds under trees, finding it improves soil quality and reduces evaporation. De Keur notes, "Healthy soil helps maximise water use efficiency in rain-fed and irrigated systems..." Regenerative practices turn soil into a reservoir.
- **Evaporation Reduction:** Installing shade nets protects crops and minimises water loss. De Keur reported 15-18% water savings, plus protection from hail and sunburn.
- **Orchard Modernisation:** Replacing older, water-intensive orchards with newer, water-friendly varieties and improved soil preparation reduces water use and evaporation.

While implemented at the farm level, these water-wise practices collectively contribute to broader water security by reducing pressure on shared water resources across the catchment – demonstrating how local action can yield long-term, catchment-scale impact.



"Healthy soil helps maximise water use efficiency in rain-fed and irrigated systems..."  
– De Keur

Photo by Carina Wessels

## Ecological and Agricultural Balance

Following recent floods, several growers voluntarily removed crops from flood-prone areas, increasing natural river buffer zones to prevent future damage, demonstrating a commitment to balancing farming with river health.

### Collaboration and Advocacy:

Recognising that sustainable water management extends beyond the farm gate, WFL suppliers actively engage in broader catchment collaboration. Suppliers like Doornkraal Agri participate in collective forums such as the Koue Bokkeveld Water Management Council, seeing this as integral to their "commitment to sustainable water management practices and collaborative efforts to enhance the natural environment." This involvement provides a crucial platform for engaging with Water User Associations (WUAs) and Irrigation Boards (I.B.s), facilitating essential information exchange, enabling participation in collaborative decision-making processes, and contributing to policy discussions relevant to water management.

Through such collaboration, suppliers aim to achieve benefits that cascade across the catchment. They emphasise the value of working together for a more "Holistic Water Management" approach, improved "Ecosystem Health," better "Resource Optimisation," and vital "Knowledge Sharing." In line with this commitment to continuous improvement – as Doornkraal Agri puts it, "We remain committed to maintaining and improving our water management practices ensuring sustainability and responsible resource use" – suppliers also advocate for the necessary government support needed to help enhance sustainable agriculture through assistance with infrastructure, research, and the adoption of best practices.



"Commitment to sustainable water management practices and collaborative efforts enhance the natural environment." – Doornkraal Agri

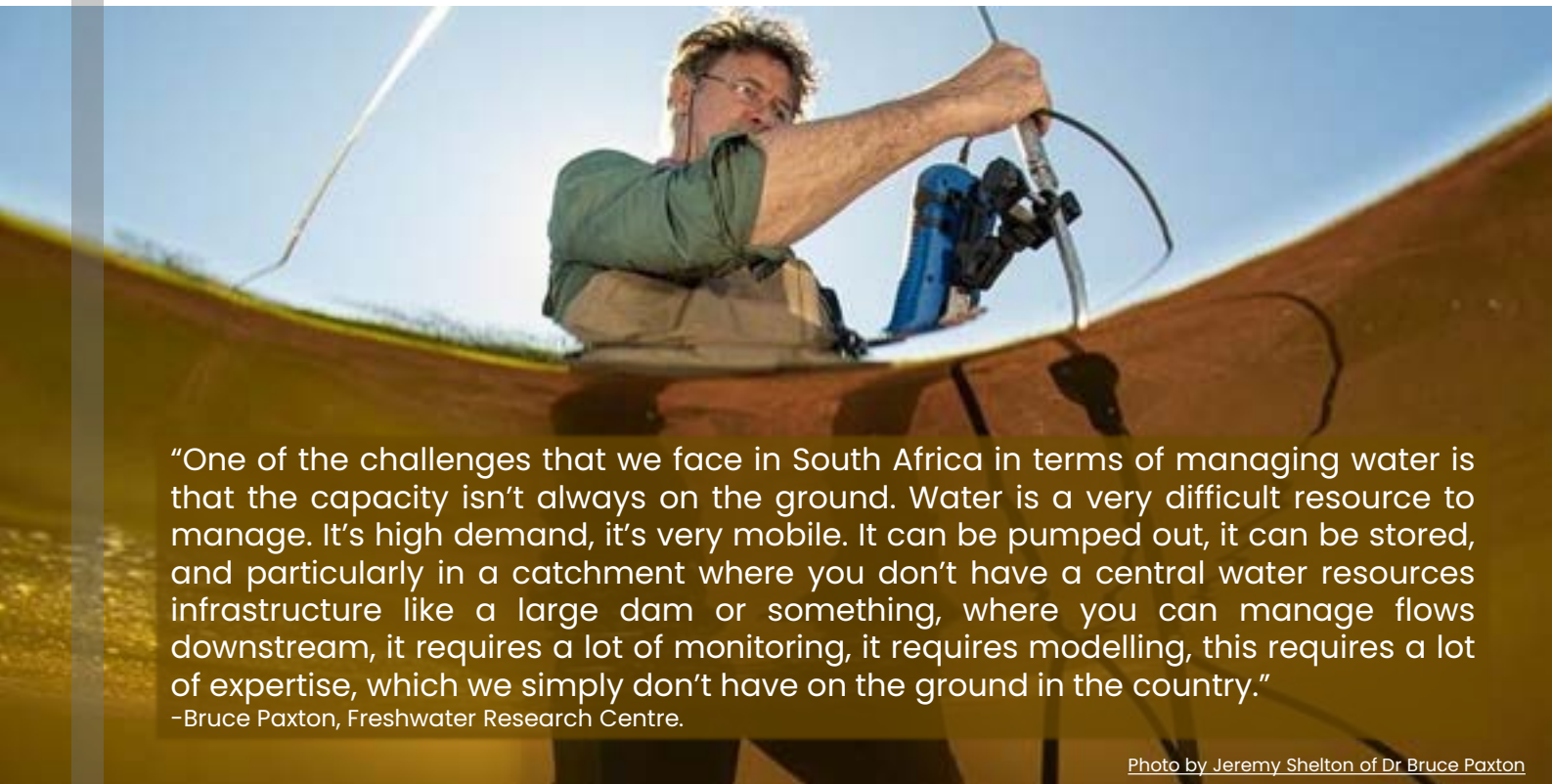
Photo by Otto Whitehead

### 3. Navigating the Challenges of Collective Water Management

While collective action drives progress, the dynamic nature of catchment management means implementation requires ongoing adaptation and faces certain hurdles:

- **Operational Adaptations:** Rolling out new tools and strengthening partnerships across the catchment involves coordinating many stakeholders. Sometimes, aligning timelines and operational processes requires adjustments and interim measures to ensure long-term goals remain on track.
- **Climate Impacts & Budget Constraints:** Significant weather events, particularly recent floods, caused infrastructure damage (e.g., roads), impacting access and operations within the catchment. Critically, the cost of rebuilding essential farm infrastructure constrained farmer budgets for voluntary water stewardship activities like alien clearing and replanting, shifting priorities towards immediate business survival needs.

WFL suppliers and growers voice a need for greater government support. Rietfontein Farm noted, "We as growers do a lot to ensure that the farm stays clear of invasive plants and this expense falls on the farm." Doornkraal Agri echoed this, stating, "We acknowledge the need for greater levels of government support and involvement at the farm level" for adopting sustainable practices, infrastructure development, research, and financial assistance to invest in sustainable technologies. They also see potential in enhanced groundwater monitoring: "We believe that expanding our monitoring practices could enhance our understanding of groundwater dynamics and contribute to more effective and sustainable land management."



"One of the challenges that we face in South Africa in terms of managing water is that the capacity isn't always on the ground. Water is a very difficult resource to manage. It's high demand, it's very mobile. It can be pumped out, it can be stored, and particularly in a catchment where you don't have a central water resources infrastructure like a large dam or something, where you can manage flows downstream, it requires a lot of monitoring, it requires modelling, this requires a lot of expertise, which we simply don't have on the ground in the country."

-Bruce Paxton, Freshwater Research Centre.

Photo by Jeremy Shelton of Dr Bruce Paxton

## 4. Conclusion & Future Outlook

The Koue Bokkeveld case study highlights the significant progress made through the collaborative Water Roadmap initiative, driven by WWF South Africa and actively supported by WFL and its suppliers. Despite operational challenges and the impacts of extreme weather, tangible results are being achieved in invasive species control, on-farm water efficiency, biodiversity conservation (particularly for the Twee River Redfin), and strengthening catchment governance.

WFL suppliers demonstrate leadership through innovative farm practices and substantial contributions to clearing and restoration, while also advocating for greater government support and structured collaboration via WUAs. As Doornkraal Agri states, "Collaborating with catchments can bring several benefits...fostering healthier ecosystems and preserving biodiversity."

Looking ahead, the focus remains on scaling impact by expanding restoration efforts, enhancing monitoring (including groundwater), securing sustainable funding, and continuing to build resilience against climate change. The commitment to collective action in the Koue Bokkeveld provides valuable lessons for water stewardship, aiming to secure water resources, protect unique biodiversity, and support sustainable agriculture in this vital South African catchment.



Photo by Malissa Murphy

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