CREW newsletter
Volume 16 • May 2020

Editorial

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CREW, the Custodians of Rare and Endangered Wildflowers, is a programme that involves volunteers from the public (citizen scientists) in the monitoring and conservation of South Africa's plant species of conservation concern. CREW aims to capacitate a network of volunteers from a range of socio-economic backgrounds to monitor and conserve South Africa's threatened plant species. The programme links citizen scientists with their local conservation agencies, and particularly with local land stewardship initiatives, to ensure the conservation of key sites for threatened plant species. Funded by the South African National Biodiversity Institute (SANBI), Botanical Society of South Africa and the Mapula Trust, CREW is an integral part of the work on surveying South Africa's plant species of conservation concern.

This newsletter is filled with incredible articles that highlight the activities undertaken by the CREW citizen scientists during 2019. With the aim of keeping this citizen science programme optimally effective, we work towards achieving a balance of monitoring our flora, promoting plant conservation awareness and ensuring that gathered information is used to influence conservation decision making.

The structure and operations of the CREW programme have always been guided by international best practice for plant conservation, with the Global Strategy for Plant Conservation (GSPC) being the framework that we operate in. After two decades,

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the GSPC is refining and planning new plant conservation objectives and targets for the next ten years and beyond, while also aligning the strategy with the Convention on Biological Diversities' post-2020 strategic biodiversity framework, and the UN Sustainable Development Goals. The GSPC 2021–2030 will have an increase from 16 to 18 clear targets that address specific plant conservation goals, while incorporating new aspects and priorities, including ecosystem services and sustainable use of plants for people. Ecological restoration is a new target and recovery plans for all threatened and rare plants are being proposed. Moreover, the strategy has emerging targets focussing on urban areas, poverty and economic development, as well as ensuring access to plants for conservation, science and sustainability.

The CREW programme is fortunate to have already begun working on ecological restoration – the Tokai project – and recovery plans – *Marasmodes undulata*. Donavan Kirkwood (curator of the Stellenbosch University's botanical garden) detailed the risk of having the vast majority of remaining populations of our species of conservation concern remaining at a handful of sites, many of these under no protection, at the CREW annual Cape Floristic Region (CFR) workshop. He suggested extending our CREW model by creating a GREW component (Growers of Rare and Endangered Wildflowers) – plant growers focussing on increasing ex situ mother stock for specific species of conservation concern – that can be used to reintroduce and bulk up wild populations. If you are keen on growing plants, please read Donovan Kirkwood's article elsewhere in this newsletter and chat to your node coordinator to discuss how we can unlock funding to initiate GREW, as it correlates with the species recovery plans target of the GSPC.

This has been a year of many successes, obstacles and fascinating discoveries. The CREW programme's network of citizen scientists has, once again, collected accurate, reliable and recent plant species data to input into the National Red List, lodged close to 1 000 new specimens at herbaria across the country, and banked an assortment of seed collections for the Millennium Seed Bank Partnership (MSBP) programme. Passionate about mentoring and contributing to transforming the biodiversity sector, the CREW programme has hosted nine individuals across its three nodes over the past year, and each intern has detailed their work and particular projects.

iNaturalist is a powerful tool to capture biodiversity observations while engaging with a wide network of citizen scientists. In response, the CREW programme utilises this effective smartphone technology to streamline data collection, we have created CREW projects on iNaturalist and subsequently Red List category projects. The CREW nodes are overwhelmed by the number of observations we have received in just one field season.

The Red List team has been, for the past few years, focussed on the species component of the National Biodiversity Assessment. One of their analytical findings is that the CREW programme is exceptional at recording which species occur at a specific site, as in which species are present and what threats are effecting the species, but that is only half of the picture as which species are missing is also required to enable the scientists to respond to how or why our species' risk of extinction change over time. We also need to be tracking certain populations to understand how particular threats, such as livestock grazing or invasive species, impact them. South Africa has progressed in fine-scale biodiversity geographical information systems such that we are now able to obtain a map detailing species that could occur at a specific site. This enables us not just to record what is at the site, but also what is absent, and this is what is required to complete the gaps in our knowledge on the status of biodiversity. It is also important that we return to sites we have visited before and record when species that we knew were there in the past have disappeared. Each CREW node is now tasked to assist with collecting species absence data and we are currently finalising the methodology.

Attendees of the CREW annual summer-rainfall region workshop would recall the brainstorming session whereby groups discussed four topics – increasing support to biodiversity stewardship programmes, working with traditional healers and indigenous knowledge, supporting municipalities, and expanding the CREW network. The CREW team interrogated these topics further at our biannual strategic planning workshop and have earmarked a few activities to be pursued in the upcoming year.

Finally, our last newsletter introduced the concept of the national environmental screening tool – the process of using spatial environmental data to determine if applications for environmental impact assessments have considered the major environmental issues in the area where development is being proposed. This tool, which is now available at https://screening.environment.gov.za/screeningtool/#/pages/process, will empower our citizen scientists on commenting on applications, verifying the exact

footprints of the proposed development and confirming the level of sensitivity (likelihood of species of conservation concern to be present) of the particular site.

The articles published in this newsletter are a testament to the high level of commitment, camaraderie, resourcefulness and willingness of citizen scientists that participate in all CREW activities. We are appreciative to everyone who has contributed over the past 17 years towards maintaining the CREW programme's success. We sincerely thank our funders, the Botanical Society of South Africa and the Mapula Trust, for their ongoing support and commitment to the CREW programme, as well as the Mohamed bin Zayd Species Conservation Fund for funding the CREW CFR node's *Marasmodes* project.

CREW Cape Floristic Region (CFR) overview

By Ismail Ebrahim

Adaptation and resilience is a key requirement for species survival in challenging conditions. The drought has affected vast areas, but in many cases we see the incredible resilience of nature. The CREW programme, too, has undergone a period of adaptation and, hence, we continue to successfully implement this amazing programme and still continue to grow. We keep the programme fresh by always adapting and trying to improve on what we have done. Embracing technology has been one of the recipes of our success.

The iNaturalist platform has opened a world of opportunities for citizen scientists to contribute to our understanding of the natural world and advance biodiversity data collection. At the beginning of 2019, Dr Tony Rebelo announced that Cape Town will be competing in the Global City Nature Challenge whereby members of the public observe and record as many species in nature as possible. Cities compete against each other to see who can post the most observations, record the most species and engage the most people. The CREW team was involved in organising bioblitzes, pre-event iNaturalist training and, during the challenge, of posting and identifying observations. To be competitive, Tony set some incredibly ambitious targets for Cape Town. We needed 50 000 observations, 3 500 species and 2 000 observers to stand a chance of winning the challenge – and of course winning was always the plan. A wide range of stakeholders partnered to organise events across the city in the four days of the challenge. The City of Cape Town was one of the main driving forces and waivered entry fees to all city nature reserves to encourage participation. We were witnesses to the power of citizen scientists!

Our course was set and after an amazing week of collective effort by the citizens of Cape Town, we came out tops with 53 775 observations and 4 587 species recorded. This was enough to the give Cape Town the win. Some of our CREW volunteers featured in the top 10 for number of observations, number of species recorded and number of identifications given. The 2020 City Nature Challenge was supposed to take place from 24–27 April and the cities of Cape Town, Durban, Tshwane, Port Elizabeth and the Garden Route were to compete for top honours.

Figure 1: Learners from Pella Primary School participating in the City Nature Challenge.

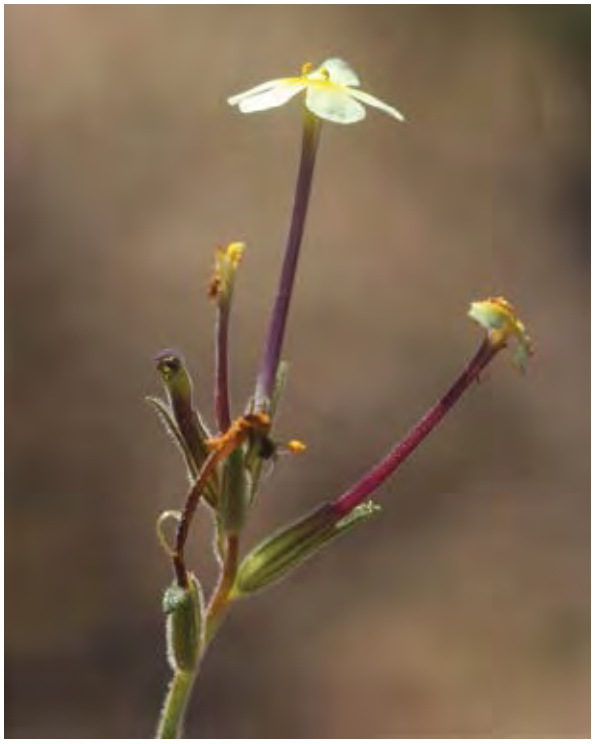

Figure 2: *Polycarena nardouwensis* found in the Nardouw Mountains.

However, due to the COVID-19 lockdown, the challenge has been converted to the South African Lockdown Project whereby people are encouraged to observe nature in their gardens.

One of the CREW CFR node's key projects, started in 2019, is the *Marasmodes undulata* project which is funded by the Mohamed bin Zayd Species Conservation Fund. In Janine Steytler's article elsewhere in this newsletter, she highlights the work that we have been doing on site, but I would like to mention the other aspects of the project as well. Through this project we have built a strong relationship with the Drakenstein Municipality and we are supporting them in effectively managing the natural vegetation at Orleans Campsite. Furthermore, our support with updating the management plan for this site, has allowed for an event where we could create awareness of the conservation importance of the campsite with staff of the recreational park. We have also been looking at other natural vegetation remnants in and around Paarl, to determine if there are suitable sites where we could possibly reintroduce *Marasmodes undulata*. We will also be supporting the municipality to survey other key sites that are being considered for biodiversity stewardship.

There has been a dramatic increase in the number of new areas transformed for agriculture and, because the CREW programme has not done much surveying in this area, we have very little distribution data for species occurring there.

In 2019 we had a record number of interns involved in the CREW CFR node. As a result, many of the node's highlights of the year can be found in their articles. We worked together well and conducted field trips across the Western and Northern Cape. It was a good opportunity for our interns to gain experience in planning field trips and surveying threatened plants in particular. This year our monitoring targets was determined by the list of all the threatened plants still to be surveyed; an ideal opportunity for us to target areas that we have not been to yet. I would like to share some highlights from one of the trips that I organised to search for critical habitat species and some of our high priority target species.

In August we set off to Nieuwoudtville to conduct annual monitoring of *Euryops virgatus* in the Hantam National Botanical Garden. We planned four additional days of fieldwork around the Hantam area. On the first day we searched for priority species along the Oorlogskloof Road in the fynbos area close to the edge of the escarpment. We recorded *Xiphotheca canescens* (VU), *Leucadendron meyerianum* (EN) and *Geissorhiza subrigida* (CR). We also visited Avontuur Nature Reserve, which is about 12 km northwest of Nieuwoudtville and found *Heterorhachis aculeata* (VU), *Leucadendron remotum* (EN) and *Arctotheca marginata* (VU). The following day I headed to the Hantamsberg near Calvinia. The drought most certainly had an impact on the lowlands, as it was extremely dry and barren on the flats and lower slopes of the Hantamsberg. Once I reached the top there were more plants in flower and, although not as abundant as usual, some incredibly special geophytes were flowering – *Romulea hantamensis* (Rare), *Paurdia alticola* (NT) and *Cliffortia arborea* (VU) to name a few.

I finally got a chance to tick off one of the botanical hotspots on my bucket list – the Gifberg where I visited the farm 7 Fontein, a well-known treasure chest of special plants. Target species found included *Serruria lacunosa* (CR), *Zaluzianskya acrobareia* (Rare) and *Leucadendron roodii* (EN). I spent the last day of the field trip in the Nardouw Mountains. This

area is being impacted by the expansion of cultivated rooibos tea lands. There has been a dramatic increase in the number of new areas transformed for agriculture and, because the CREW programme has not done much surveying in this area, we have very little distribution data for species occurring there. The main highlight of the trip was finding *Polycarena nardouwensis* (EN), which is known from less than five records and was last collected in 1976.

One of our priorities is to establish a CREW node in the Northern Cape. Leandra did fantastic work surveying some of the critical habitat species in the Northern Cape and highlighting the issue of illegal harvesting of succulent plants, which is why it's critical to have a CREW presence in this province. We will work towards strengthening our partnership with key stakeholders, especially Wilderness Foundation Africa who is involved in working with landowners to expand existing protected areas and establish new reserves that conserve representative ecosystems in the Northern Cape. In 2020 we will endeavour to engage suitable volunteers to establish a CREW node and survey species of conservation concern known to occur in the Northern Cape.

Our work with the universities continue to improve. We conducted our lecture series on Red Listing and threatened plant conservation at three institutions in the Western Cape. Our biodiversity camp with the University of the Western Cape's honours degree students was a great success, since we included a new activity to draw on their theoretical knowledge of conservation and apply it to a real life example. The activity was a challenge to conduct a stewardship assessment of the property where the camp was held and it involved mapping, field surveys, determining conservation value and report writing. This was a great experience for students to apply their knowledge to processes that are critical for conservation.

Figure 3: *Romulea hantamensis*, one of the critical habitat species.

The CREW CFR node has had another great year of plant surveying and building partnerships with new volunteers and conservation stakeholders. In 2020 we look forward to bringing a few more groups into the CREW family and expanding the programme to other parts of the country where our threatened flora needs protection. We thank the CREW CFR citizen scientists in particular for contributing to our node's success.

Darling and West Coast CREW

By Helene Preston

The wildflower year started with a few short walks around Darling and Langebaan checking on the state of the veld after a long hot and dry summer.

Our first outing was with Ismail and Elise Claassens from Jacobsbaai CREW to assess the WWF site between Jacobsbaai and Saldanha Bay. There is no control of access with the result that the area is heavily overgrazed by a local small scale farmer and the plant life is suffering severely. Despite the heavy grazing there were still many *Daubenya zeyheri* (EN) flowering. The future of the area is uncertain and we hope that WWF and the local farmer can come to an agreement about the illegal grazing on site.

On 3 July we visited the hill on Klipberg farm just outside Darling with the members of Blaauwberg CREW looking for *Ruschia klipbergensis*, but

Figure 1: Klipberg, one of the new sites we visited in 2019.

unfortunately we were unsuccessful. However, we did find another new site for *Aspalathus glabrata* (EN). Luckily the site is very steep and rocky so the plants are relatively safe from livestock.

A week later we visited the Cape Columbine Nature Reserve with the local BotSoc branch members to further add to the plant list for the local authority. We found a good population of *Phylica greyii* (EN), *Oscularia vredenburgensis* (EN) and plenty of *Romulea barkerae* (EN) in flower.

I was asked to help with the setting out of a wildflower trail at the West Coast Fossil Park but with the dry season there were very few flowers to name along the trail.

All the public open spaces within the Swartland Municipality are in the process of being declared local authority reserves and all the documentation and public processes for the two reserves at Darling have been completed.

Next we went to another hill along the line of Darling Hills at Slangkop farm, where the Tienie Versfeld Reserve is situated. The vegetation on the granite hill is well protected and we found another new population of *Aspalathus glabrata* (EN) amidst the wonderful renosterveld spring flowers. We visited Oudepost this year to check up on *Babiana pygmaea* (CR) and, despite the previous dry seasons and heavy grazing in summer, the plants were in abundance. It is amazing to see how resilient these plants can be.

I was asked to accompany a group of flower enthusiasts on the Postberg Hiking Trail in mid-August, which is the best time to see the flowers in this iconic reserve. On 20 August we had a combined outing with Ismail, Friends of BCA and Jacobsbaai CREW to sites near Vredenburg looking for *Romulea elliptica* (CR). After a long hot day in the field we finally relocated the population seen by Nick Helme a few years ago at the Saldanha Airport. We found 32 plants and had a conversation with one of the residents at the airport to make them aware of the importance of conserving the site.

Figure 2: *Babiana pygmaea* at Oudepost farm.

I had a wonderful afternoon with the third-year botany students from the University of Johannesburg at Tienie Versfeld Reserve at the end of September. Luckily we found some of the specials including *Geissorhiza darlingensis* (CR) which was a highlight for them. They were doing a spring trip to the Cape Floristic Region as part of their course.

The damaged site (scraped during the Day Zero crisis) within the Renosterveld Reserve in Darling has recovered remarkably with resprouters and annuals evident. The municipality has engaged workers to weed during the winter and spring as *Echium* is a severe problem. All the public open spaces within the Swartland Municipality are in the process of being declared local authority reserves and all the documentation and public processes for the two reserves at Darling have been completed. This has been a long process, but we are finally reaching the final stages of the Darling reserves getting the conservation protection they deserve. We were also extremely happy to find *Geissorhiza platystigma* (EN) again within the Darling Renosterveld Reserve.

At the beginning of November, we had another combined outing with Blaauwberg CREW and Ismail and the interns to Bokbaai farm on the coast near Darling. A long list of plants with many specials were found by everyone and, finally after hunting in three sites, I found the elusive *Pelargonium sabulosum* (EN) at the original documented site. Only two plants were found but we are confident that we will find more in the future now that we know what we are looking for. Later, the farm manager drove us to the dune area inland from the coast where we found an *Acrolophia lamellata* (LC) in the restios, a large population of *Disa draconis* (EN) and *Afrolimon longifolium* (LC). This farm is part of the Dassenberg Coastal Conservation Partnership (DCCP) with CapeNature and the City of Cape Town, and we hope this treasure trove of plants will always be protected.

Our last trip for the year was to Trekoskraal near Paternoster with the local BotSoc members. The veld was extremely dry so the only threatened plant we recorded was *Afrolimon capense* (NT).

I thank Ismail and everyone at CREW for the continued inspiration and assistance for us to do what we also love doing best.

Figure 3: Group of students from University of Johannesburg.

Friends of Blaauwberg Conservation Area (FoBCA) & Friends of the Tygerberg Hills (FoTH) CREW groups

By Petra Broddle

Figure 1: FoTH and FoBCA at Vondeling in the Paardeberg Mountains.

At Baas Ariesfontein, last visited in 2013, we added 24 new species including four Red-Listed plants to the ever growing species list.

The Friends of Blaauwberg Conservation Area (FoBCA) and Friends of the Tygerberg Hills (FoTH) CREW have had a busy year with 77 field days out. We posted 4 296 observations on iNaturalist, of which 91% were plants and 3% were insects. A large proportion (67%) were of research grade and 30% still require identification. We submitted 171 observations to the Southern African Red List project, 226 observations to the CREW Species Sheet project and 43 observations to the CREW Site Sheet project.

It has been a good mix of known and new sites and Jacques van der Merwe of the City of Cape Town (CoCT) has introduced us to a number of sites beyond the development periphery.

Most of our threatened plant highlights were found relatively close to home. We visited the Diep River Corridor for the first time and surveyed the new extensions in Rivergate and Sandown where we found *Steirodiscus tagetes* (VU) prior to development. Our Sandown survey will hopefully contribute towards an expanded conservation corridor. The Van Schoorsdrif Conservation Area east of Morning Star continues to yield treasures including *Chrysocoma esterhuyseniae* and *Marasmodes fasciculata*, both Critically Endangered. We joined the CoCT's seed collecting days to visit the Morning Star ESKOM Servitude heading south and found *Adenogramma rigida* (EN), *Leucospermum hypophyllocarpodendron* subsp. *canaliculatum* and *Serruria decipiens* both listed as Vulnerable. At Baas Ariesfontein, last visited in 2013, we added 24 new species including four Red-Listed plants to the ever growing species list.

The primary threat at almost all sites we visited was invasive *Acacia* species and, although in most cases an active management system was in place, the problem is still concerning. Urban sprawl continues apace

although the Spatial Development Plan now requires densification within existing residential areas.

We visited Bokbaai and Grotto Bay for the first time and new areas around Silwerstroom. In the Silwerstroom area we worked closely with the local CapeNature staff on numerous occasions. The vegetation belt sweeps inland towards the Dassenberg Hills and we visited new sites south of Atlantis (Woodlands, part of the Driefontein Cluster) and east of Mamre. At Woodlands we found *Babiana blanda* (CR) and *Cliffortia acockii* (CR).

We joined Ismail and the Darling CREW at Bokbaai and found the target species *Pelargonium sabulosum* (EN), *Aspalathus retroflexa* subsp. *bicolor* (CR) and a fine show of *Disa draconis* (EN). We again joined the Darling CREW to visit the geologically interesting Klipberg north of Darling, but did not find *Ruschia klipbergensis* (DD) that we set out to search for.

To the northeast of the city, conserved areas tend to be scattered and isolated. Often on geologically complex rocky outcrops, these sites are a mosaic of vegetation types. Towards the east we visited Kuilenburg and in the new Klipheuwel Corridor, Fynbos Farm. At Fynbos Farm we found *Podalyria microphylla* (CR), *Rafnia angulata* subsp. *ericifolia* (CR) and *Leucadendron verticillata* (CR). At Kuilenburg we found an amazing haul of species including five Critically Endangered species, namely *Serruria pinnata*, *Watsonia strictiflora*, *Codonorhiza elandsmontana*, *Babiana regia* and *Podalyria microphylla*.

We ended our year above Wemmershoek Dam at the Voortrekker Kampterrein site adding 49 new species to the list, including *Arctotis angustifolia* (CR), *Muraltia decipiens* (EN), *Lachnaea uniflora* (VU) and *Otholobium rotundifolium* (VU).

Our CREW group continues to produce plant lists recording phenology for all sites visited. We would like to extend a special thanks to FoTH for sponsoring fuel, FoBCA for keeping our GPS going and the Environmental Liaison Committee: Blaauwberg Development Area for funding a new camera for my use.

Figure 2: Critically Endangered *Serruria pinnata.*

Figure 3: *Watsonia strictiflora*, one of the Critically Endangered species found at Kuilenburg.

Swartland CREW update

By Fiona Hellman

The year 2019 turned out to be a very busy and varied one for Swartland CREW. In April 2019, a controlled burn took place on Kasteelberg Mountain, Riebeek Kasteel and Riebeek West, where the top of the mountain is Hawequas Sandstone Fynbos and the lower slopes are covered in Swartland Shale Renosterveld. A lot of controversy surrounded the burn and there was a lot of activity on social media – both for and against it. Eventually once the controlled burn was done, calmer and more enlightened voices were being heard and the end result was that more people were aware of renosterveld and why fire was necessary to keep the renosterveld healthy and stop the spread of alien vegetation.

During the year, we undertook many field trips, some to our usual sites like Driehoekpad, Klipkoppie, Swartdam and Kloovenburg whilst others were new to us. One of these was an 'Oxalis hunt' at Kapteinskloof in the Piketberg area. SANBI interns Leandra Knoetze, Janine Steytler and Sharndre Coutriers put together a document with photos and descriptions of target species. Unfortunately, we didn't find any of the target species but we did learn a lot about *Oxalis* and how to identify them, i.e. look at the bulb!

In August 2019, Andre Venter and I were privileged to attend the Fynbos Forum at Baardskeerdersbos. It was such good exposure for us to be able to attend the presentations and field trips with so many experts in their field. We both learnt a lot about what is happening in fynbos conservation.

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In July, Ismail Ebrahim and other CREW members joined us on a field trip to Pulpit Rock Winery in Riebeek West. We surveyed the patch that had been part of the controlled burn. In years to come this patch should yield some interesting things.

In October, Victoria Wilman and Naomi Mdayi came to Riebeek Kasteel to present a seed conservation course. Kloovenburg Wine and Olive Estate very kindly made space available for us in their packing

Figure 1: Controlled burn on Kasteelberg, April 2019.

Figure 2: Swartland CREW members with MSBP on the seed conservation course.

shed. The course included a practical session in the field where we learnt how to press specimens, mark plants appropriately and collect seeds.

Swartland CREW members are involved in a very exciting project to conserve *Moraea gigandra* (EN). This species is endemic to the Porterville/Piketberg area of the Western Cape and is only found on a few remnant patches of renosterveld. The conservation project is being undertaken by the Bergrivier Branch of the SA Hunters Association, with support from CapeNature and CREW. One objective of the project will be to start a nursery to propagate *Moraea gigandra* plants from seed collected from the wild populations and then to replant these back in the remaining natural habitat. It a very exciting project and one which Swartland CREW is looking forward to supporting. All in all, we really enjoyed our botanising in 2019!

Figure 3: The endangered *Moraea gigandra*.

Kleinriver mountain project

By Christopher Whitehouse

Mention the Klein River Mountains and everyone immediately thinks of Fernkloof Nature Reserve above Hermanus and the adjoining Vogelgat Private Nature Reserve. Much work has been done there, recording the flora over many years by a ready team of willing amateur and professional botanists. Because the species diversity there has been so thoroughly explored, this often translates into people thinking that the whole mountain range is well known. However, work at Phillipskop Mountain Reserve, at the eastern end of the range, over the past five years has shown that there is still much to be discovered about

The total number of species found across the range has now reached 1 440, with about 50 species added as new records for the Klein River Mountains, thanks to the survey work.

the flora. Of the 700 species recorded at Phillipskop to date over 20% had not been recorded at either Fernkloof or Vogelgat.

It became clear that if the flora at Phillipskop was so different, it was very likely that the rest of the mountain range would also hold some interesting discoveries. To this end, a successful application was made for a Table Mountain Fund small grant to assist with an initial survey of the range. Most of the land is in private hands and so a large part of the pilot survey involves establishing contact with land owners regarding access permission. It is also important to build up a team of local volunteers who can begin to survey the properties and load up results onto iNaturalist following the CREW protocol. To that end Ismail's assistance has been invaluable, holding a workshop for the Hermanus Botanical Society with members joining us on some of the outings.

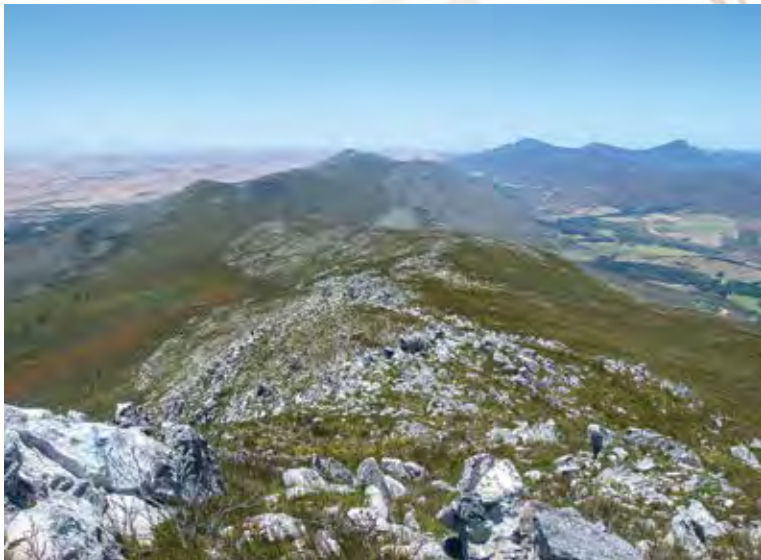
Since October when the project began in earnest, five properties have had an initial survey. Each survey has revealed over 200 species per property. While this is impressive for a snapshot in time, it is still low compared to the more thoroughly explored reserves mentioned above, which have between 700 and 1 100 species. A balance will therefore need to be struck between surveying new properties and returning to properties at different times of the year. The total number of species found across the range has now reached 1 440, with about 50 species added as new records for the Klein River Mountains, thanks to the survey work.

Figure 1: Klein River Mountains CREW survey team.

Notable Red-Listed finds from the survey work include *Ixia leucantha*, an endangered member of the Iris family previously known only from a small area around Elim, and *Pteronia scabra*, an endangered daisy known from three other locations. The location and population sizes for several local endemic ericas have been recorded, such as *Erica octonaria*, *Erica latituba* and the mouse-pollinated *Erica lanuginosa*. Increased range extensions have also been found for *Cliffortia dregeana*, *Leidesia procumbens*, *Podocarpus latifolius*, *Cannomois virgata* and *Erica annectens*. Not surprisingly, the identity of several records still needs

Figure 2: *Erica lanuginosa*.

Figure 3: Eastern end of Klein River Mountains from Klippiesberg.



to be confirmed but already it looks like a new species of *Sebaea* has been discovered on the high marshes above Stanford.

And of course, the work is far from over as many parts of the range, especially the northern slopes, have not yet been surveyed. There are also several endemic and rare taxa from the range which have not been recorded for many years, or their exact location and population size is unknown. It is particularly hoped to target these in the later stages of the survey work.

CREW Hottentots Holland

By Carina Lochner

We started the year with almost weekly visits to the Steenbras Nature Reserve to do post-fire monitoring in an area south of the Steenbras Dam that burned in the January 2019 fire. We were grateful to City of Cape Town staff who arranged access and provided transport. Very few species were out on these early visits but it was interesting to see *Mairia coriacea* flowering within weeks of the fire. On an outing in February we ventured further into mature veld where we recorded *Cliffortia recurvata* (VU), *Klattia stokoei* (EN) and *Agapanthus walshii* (EN) amongst others.

In January we were pleased to see the beautiful *Protea lorea* (NT) in bud and in bloom in several places in two-year-old veld at Lourensford Estate. Young pines and hakea were also making a comeback and need to be cleared.

As our areas overlap, we sometimes join forces with the Kogelberg CREW group. On a drizzly day in March we recorded *Haemanthus canaliculatus* (EN) at several sites, some on plots that will be built on in future. Let's hope they look at iNaturalist before building!

The City Nature Challenge in April was truly a challenge. The aim was to fit in as many sites and record as many species during the four days as possible. Again, we had good cooperation from City of Cape Town staff and landowners. The busy days and late nights proved worthwhile when Cape Town won the challenge and Helen from our group won an award for most species, Magriet (who joined us from Kleinmond) posted the most observations, and Evan posted the winning observation for Cape Town – a beautiful male leopard photographed with a camera trap at Lourensford.

The highlight of the year was another visit with Ismail to Groenlandberg, this time in November, eleven months after a fire. Getting up there is truly a privilege. We recorded many species in the young veld, including 16 orchid species, among them the rare Disa bodkinii *and* Evotella rubiginosa.

Figure 1: Evan finds *Protea lorea* (NT) in flower at Lourensford Estate. Photographer: Carina Lochner.

As always, the CREW workshop in May was an opportunity to learn from the very interesting presentations, meet old friends, make new ones and compare

Figure 2: *Evotella rubiginosa* (Rare), Groenlandberg. Photographer: Carina Lochner.

notes. Thanks to the CREW Cape Town team for a well-organised and interesting workshop.

The highlight of the year was another visit with Ismail to Groenlandberg, this time in November, eleven months after a fire. Getting up there is truly a privilege. We recorded many species in the young veld, including 16 orchid species, among them the rare *Disa bodkinii* and *Evotella rubiginosa*. Some of these species will only flower again after the next fire. There was no sign of *Protea stokoei* which we saw in flower in October 2018. We can only hope that it had enough time to produce seed before the 2019 fire.

In Somerset West, our home ground, the fence at Onse Jan Park finally went up and we could relax about cars driving in the park. The *Ixia versicolor* (CR) together with ten other species of conservation concern all flowered well. We were also able to add a few more species to the list, among them the delicate *Pelargonium longifolium* and a lovely surprise a few days before Christmas – kukumakranka which I never expected to see flowering in a residential area.

Figure 3: *Disa bodkinii* (Rare), Groenlandberg. Photographer: Carina Lochner.

Kogelberg CREW

By Magriet Brink

Last year was a good one for Kogelberg CREW. Our address list grew from three to 36 and our annual submissions list grew from fewer than a dozen to 220.

Two bits of technology helped enormously. Firstly, our new WhatsApp group works like a bomb! Secondly, iNaturalist is invaluable in many ways and I'm beyond proud of my volunteers for biting the bullet and coming to grips with the new data submission projects. Thank you, Ismail, Tony and all the behind-the-scenes elves who work so hard to make life easier for us volunteers.

In January 2019 a fire, propelled by a northwestern wind gusting at almost 100 km/h, raged through the Betty's Bay and Pringle Bay area. Several lives

Figure 1: Jenny from Outramps enjoying our beloved *Mimetes hirtus.*

were lost, many homes and other buildings were destroyed and more than 5 000 hectares were burnt to the ground, much of it pristine fynbos in the Kogelberg Biosphere Reserve. We are privileged to help out with ongoing post-fire monitoring on affected plots and in the surrounding veld. My personal highlights include seeing fields of *Haemanthus canaliculatus* (EN) and *Erica patersonii* (EN) and I also had my first encounter with the near invisible *Disa sabulosa* (EN), one of many orchids we found.

For the City Nature Challenge, we joined the Hottentots Holland CREW team and had enormous fun documenting everything the eye could see in Steenbras Nature Reserve and on Vergelegen and Iona farms in Somerset West. We clambered up a precipitous slope to find *Erica amidae* (VU) clinging to the rocks. Having since mastered the art of submitting species of conservation concern via iNaturalist, we recently found it tremendously rewarding to discover that many of the other plants we documented are also of conservation concern.

iNaturalist is invaluable in many ways and I'm beyond proud of my volunteers for biting the bullet and coming to grips with the new data submission projects.

Three Outramps CREW members, Jenny, Sandra and Ann, visited Kleinmond in September. I joined them for field trips to well-known and much-visited areas and was reminded again how very special our beloved Kogelberg is. Showing off our healthy population of *Mimetes hirtus* (VU) was a highlight, especially as we had to tread carefully to avoid trampling the many other specials along the way. There was

Figure 2: *Haemanthus canaliculatus* in full bloom.

Figure 3: Rooiels volunteers, Ismail and the Hermanus Botanical Society members' first outing with us.

lots of inspiring sharing of practical tips and deep wisdoms. I was able to repay the visit and experience the Outramps in their natural habitat on a field trip to Camferskloof in November. It was a truly enlightening day and also great fun.

Thanks to Rupert, we found and recruited the wonderful Hermanus Botanical Society (HBS) this year. Their members joined us on field trips, we joined them at Fernkloof Nature Reserve, and together we started helping Chris Whitehouse with his Kleinrivier Mountains project. I'm very pleased to report that HBS will be forming their own CREW group this year.

The new year is already well on its way without much time for reflection. I look forward to many more opportunities to join forces with various CREW groups, another twenty-fold boost in submissions performance (go team Kogelberg!) and, always, new discoveries on our beautiful doorstep.

Outramps CREW

By Jenny Potgieter, Evie Bowen and Di Turner

The Outramps are divided into four groups – Lowland Team (LOT), Somewhere in the Middle (SIM) and High Altitude Team (HAT). We also have Stellenbosch University Node (SUN). The groups are not cast in stone and frequently overlap when we do joint trips. Apart from finding and monitoring the rare and threatened plants, we also collect specimens for the Southern Cape Herbarium, seed for the Millennium Seed Bank, engage with municipalities on conservation issues and are using iNaturalist to document all the plants and some of the insects, animals and birds that grow and live, wherever we are in South Africa.

For this report, we have chosen to highlight one field trip done by each group. Special mention must go to Dave Underwood. He is based in Namibia, but explores all over southern Africa when he has a moment, with spectacular results. A brave man – he has taken on identifying the *Phylica* species and is considering the *Muraltia* species too!

HAT Evie in the central Kammanassie Mountains

I joined the South Cape section of the Mountain Club of South Africa on an adventure into this remote corner near the head of the Klues River. An area of deep gorges, rocky peaks and ridges, steep ascents and descents. Scenically it was wonderfully rewarding

and some of the plants are unique to these mountains. This mountain range is relatively unknown – its make-up is a short chain running parallel, between the eastern Groot Swartberg and the Outeniquas.

Our group backpacked into the mountains to set up camp near the Klues River. We set off with a bit of trepidation, as the local farmers had warned of very dry conditions and very little water coming off the mountain. Luckily, the three small streams at the head of the Klues River were still flowing. Initially, a jeep track (on higher ground lined with gorgeous pink *Agathosma ovata*) helped us gain the upper slopes with relative ease. It proved to be a great deal easier to hike, as a fire 20 months previously had cleared the original waist to shoulder-high fynbos that we had encountered on previous trips in 2015 and 2016.

From our base camp, we had two full days in which we were able to climb Perdeberg (1 837 m) and also explore the ridgeline westwards towards Kammanassie Peak. Luckily I could recognise some of the resprouting and reseeding plants in the very dry and dusty ground. On the upper rocky crags a few unburnt fynbos pockets remain in good shape.

Some of the species of conservation concern monitored included *Syncarpha montana* (Rare), *Oedera decussata* (Rare) and *Erica inamoena* (Rare).

The *Geissorhiza* hunt for Evan

Having been asked by a PhD student, Evan from the USA, to try and find certain *Geissorhiza* species from our area and to obtain leaf material for DNA studies, four of us set off for Rust and Vrede and the Swartberg Pass. We were armed to the teeth with silica gel, zip-lock packets, GPS coordinates from iNaturalist and lots of hope.

Luckily we got to the Swartberg Pass before the traffic jams started. We parked and proceeded to walk to the sites where Nicky and another had found a small *Geissorhiza* which Evan thinks is not *G. nigromontana* as posted. Just about to give up after a long search, Nicky spotted the plants. There was a small clump of them, which most people would not even have noticed. We were thrilled and proceeded to collect our samples.

Then it was off to Rust and Vrede, with many photographic stops on the way. This was another kettle of fish altogether. A huge waterfall greeted us with many hanging green leaves wherever you looked and not a flower in sight. Luckily Nicky knew where

Figure 1: Outramps exploring the Southern Cape Mountains.

Figure 2: *Geissorhiza outeniquensis* collected for Evan Eiffler.

The Outramps collectively posted over 64 000 observations, recorded 8 820 species and provided over 114 000 identifications. Well done to the Outramps team!

she had found them before and we were able to collect leaves for Evan. The plants were in bud, so we may have to return in January to see them flowering.

In the next few weeks we continued with the hunt. Evie remembered seeing *Geissorhiza inconspicua* on the southern side of Camferskloof Nek, so Sandra and Evie set off to find it. Fortunately, the plants were in full flower and prolific. Evie and Nicky then took themselves off to the Kammanassie to try to find *G. elsiae* and managed to find a plant in seed.

Lastly Di and I set off to have a look at the *Geissorhiza outeniquensis* site on the railway line. Luckily for us the plants were in glorious full flower. So happily we now had four specimens for Evan. All in all, a very successful mission.

In due course the specimens were posted off to Evan and he has received them. He is very grateful to the team for their help with his project. He promised to let us know the results in the fullness of time.

Millenium Seed Bank Partnership

Once again the post-burn scenario in large parts of the Southern Cape applied a brake to seed-collecting activities. However, there was one successful joint trip.

It was Friday 13 December and I had been waiting for nearly an hour at our meeting place at Margaret's view point on the Brenton Road, trying to find out what had happened to Naomi Mdayi and Solly Modimola, who were in the area collecting seeds for the Millennium Seed Bank Partnership (MSBP) South Africa. Thank goodness for cell phones, or we might never have connected, but when the two green-clad collectors emerged from the Kirstenbosch bakkie, I found that they had erroneously headed up Phantom Pass…after all it was Friday the 13th!

Luckily that was the only mishap of the day. After scouring the road verge for interesting seeds to collect, they did the same at Mooi Uitzicht, Endlovana and Ocean View. Seed collecting is a time-consuming activity, but once again modern technology came in useful, so that they did not collect seed that had already been banked. Nearly ten hours later, with snacks on the move, we had visited all the properties where they had been given permission to collect, many collecting forms had been completed, paper bags filled with seeds, photos taken and herbarium specimens safely stored away. Walking behind these two keen collectors, in their green overalls with bags of collections tossed over their shoulders, I commented that they looked just like Santa's helpers. The MSBP will be the recipient of their seasonal gifts.

It was very satisfying to spend a day with these enthusiastic youngsters who care so much for the environment. They keenly carried out their allocated task, working together with care, knowledge and, most importantly, good humour. I hope they achieve their targets.

To end off, we had a successful year especially in the iNaturalist department. The Outramps collectively posted over 64 000 observations, recorded 8 820 species and provided over 114 000 identifications. Well done to the Outramps team!

We are looking forward to a wonderful 2020, as Jenny Potgieter takes over the reins from retiring matriarch, 81-year old Di Turner. Early signs show a revitalisation of this hard-working CREW group.

Figure 3: Solly and Naomi from the MSB visiting the Southern Cape.

The end of a 'Fab'ulous decade

By Brian Du Preez

Following a very busy and successful 2018, it was hard to imagine that 2019 could be even better, but somehow it managed to beat 2018 in terms of exciting discoveries. The obvious highlight of the year was the rediscovery of *Psoralea cataracta* on 24 October, which had been missing for over 200 years and was listed as Extinct on the Red List. I was looking for *Indigofera* for my PhD research, and completely by accident stumbled across a population of this rather unassumingly spectacular species. The flowers are the smallest of all *Psoralea* species and I can understand why they have not been spotted for over 200 years. This area is a legume treasure trove as on this day I also found *Aspalathus fasciculata* (DDD – last collected in 1950s), *Aspalathus suaveolens* (Rare), *Indigofera triquetra* (EN) and *Indigofera* sp. nov. *paludicola*.

I travelled far and wide last year and one of my favourite trips was to the Richtersveld and back down past Nieuwoudtville and the Roggeveld escarpment in early spring. The effects of several years of consecutive drought over these areas were very obvious to see, but in the few areas that were lucky enough to receive some rain, there were some spectacular plants. Over 10 days I managed to collect about 15 *Indigofera* species in flowers and plenty of Namaqualand endemic flowers including *Moraea namaquamontana*, *Portulacaria namaquensis*, *Indigofera nudicaulis* and several *Oxalis* species.

Another of my favourite trips was to the Eastern Cape in November. On top of finding several interesting *Indigofera* species along the way, a hike up to the highest peak in the Grootrivierberge near Steytlerville produced a likely new *Psoralea* species growing 4 m high in the kloof. Coming down the mountain I also found an undescribed *Acmadenia* that Jan Vlok found many moons ago. The hike did not end very well as I fell from one rock onto another and bruised some ribs. The hike was worth the pain though, and a week later I climbed up Matroosberg with Peter Linder, carrying an overnight pack. Many other rare and interesting species popped up on random trips last year. The first of those was *Aspalathus secunda* on the first afternoon of the CREW workshop at Riebeek

The obvious highlight of the year was the rediscovery of Psoralea cataracta *on 24 October, which had been missing for over 200 years and was listed as Extinct on the Red List.*

Figure 1: Rediscovered *Psoralea cataracta*, last seen over 200 years ago.

Figure 2: *Moraea namaquamontana* from the Northern Cape.

Figure 3: Data Deficient *Aspalathus fasicularis*, which was last collected in the 1950s.

Kasteel. This species is listed as DDD and the last collection dates back to before 1950.

In May 2019 I registered to start my PhD through the University of Cape Town. The focus of the study is to revise the *Indigofera* of the Greater Cape Floristic Region, taking over from the work done by Dr Brian Schrire before he retired. This is a massive task as we estimate a total of about 150 *Indigofera* taxa to occur in a region covering about 200 000 km^2. By the end of 2019, I had collected about 80 different *Indigofera* taxa in the region, with many more on my bucket list for 2020. I have been fortunate that I could collect some of the rare and range-restricted taxa, and often it has been thanks to records from CREW volunteers on iNaturalist. I hope the volunteers continue to find *Indigofera* in the field and post them on iNaturalist, any data is valuable and I will be in contact if I need to follow up on any of your finds. Feel free to tag me on iNaturalist if you want me to see something: @mr_fab.

Update from the CREW C-team expeditions

By Joti Daya

In 2019 we had a record number of interns working in the CREW Cape Floristic Region (CFR) node. We were given the opportunity to organise field trips to help us build valuable skills in field sampling and surveying plant species of conservation concern. Each of the interns was given a geographical area to focus on. This was a great learning curve for all the interns. I will be summarising the highlights from the most successful trips we had throughout the field season.

Our first fruitful field trip was to Shaw's Mountain Pass in Caledon where we were joined by Keir Lynch and Alouise Lynch. This spectacular trip led to the rediscovery (found by Keir Lynch) of the beautiful speckled *Moraea barnardii*, listed as Critically Endangered, last seen in 2011. This population was sighted on a sandstone ferricrete ecotone ridge on the top of a mountain, right next to a road. Shortly thereafter, there were road developments and the area where one population was recorded was quarried – sadly, this population was lost. Fortunately, the story does not end there because we got to see plenty of other specials such as *Babiana purpurea* (EN), *Paranomus bolusii* (VU), *Codonorhiza azurea* (EN), *Aristea biflora* (EN) and *Erica xeranthemifolia* (CR).

I stopped to look at the view of the mountain range, in the hope of finding some inspiration, and the proverbial little voice told me to look down. And there it was. A single plant waving at me.

We then moved east of Cape Town to the small town village of McGregor in the Winelands of the Western Cape focusing on the Riviersonderend Mountain Catchment Area. Our gloomy rainy day was brightened when we found specials such as *Leucadendron nervosum* (NT), *Leucadendron cordifolium* (NT) and *Spatalla propinqua* (EN). We also visited Vrolijkheid Nature

Reserve and found *Astroloba rubiflora* (VU), *Brianhuntleya intrusa* (NT) and *Euphorbia nesemannii* (NT).

Sticking to the Winelands of the Western Cape we headed northeast of Cape Town to Tulbagh in search of one of our target species, *Circandra serrata* (CR). It turned out to be a scorcher of a day but with CREW's motto of 'no weather formed against us shall prosper' we continued and found our target species. Half an hour into our search my enthusiasm levels dropped drastically. I stopped to look at the view of the mountain range, in the hope of finding some inspiration, and the proverbial little voice told me to look down. And there it was. A single plant waving at me. According to the Red List of South African Plants it was last collected in 1913 and thought to be extinct due to the extensive habitat loss to vineyard and fruit orchard cultivation, but was rediscovered by Barry Low in 2004. Another positive note is that the landowner was made aware of the plant and was very keen on ensuring the conservation of this species.

Our next trip was once again in the Winelands but this time closer to home where we visited the Boschendal Wine Estate. This field trip was just one of a kind. We initially thought that it was a failed mission. This changed very quickly when Ismail came to our rescue, noting as he browsed through our photographs, 'Hey, what you going on about, you guys found two Critically Endangered species'. We had indeed found *Lampranthus schlechteri* (its population is estimated to number fewer than 250 mature individuals and continues to decline due to ongoing habitat loss and degradation according to the Red List) and *Arctotis angustifolia* (recorded from two severely fragmented, small subpopulations consisting of less than ten mature individuals each; we suspect that there are fewer than 250 mature individuals of this species).

Moving to the southeast of Cape Town in the Elgin Valley, we were off to Paul Cluver. This field trip was highly rewarding as the CREW Bees found a new population of *Freylinia longiflora* (CR), previously only known from around Solva in the Elgin Valley. The landowner was notified of this brilliant find.

One of our other main focus areas was the Agulhas Plains. We organised a couple of field trips to the area and the main highlights were recording *Amphithalea rostrata* (CR) and finding a new population of *Lachenalia lutzeyeri* (VU). We also made some amazing contacts with landowners in the area that are committed to conserving the amazing flora of the Agulhas Plains.

Approaching to my last few months as a CREW intern, I would like to conclude by promising to continue to render my services in the conservation industry, by improving and upholding the image of conservation. My goal is to ensure the security and the continued existence of our beautiful flora by contributing to the operations of conservation, through offering services and performing duties where needed.

Figure 1: Stunning *Moraea barnardii*.

Figure 2: *Circandra serrata*, Critically Endangered from the Tulbagh Valley.

Peninsula CREW report

By Sharndre Coutriers

I have always been interested in how people in conservation promote and conserve the vast variety of flora in southern Africa. To increase my contribution, I wanted to focus on deepening my knowledge of ecology, functions and interactions between organisms within a system, as well as the ecosystem processes and services. Therefore, this year, I will be continuing my academic career in pursuing my Advance Diploma in Nature Conservation.

My conservation career started off in 2011 volunteering at City of Cape Town nature reserves and SANParks during my studies which assisted in expanding my knowledge and gaining experience in the field. In 2012 I was appointed the nature conservation student at Kirstenbosch National Botanical Garden, and six months into my contract I was given an opportunity as a conservation worker for two and a half years. SANBI then offered me another contract as a junior nature conservationist until the end of 2016. In 2017, I started working at NCC Environmental Services as an environmental consultant, mainly doing environmental control officer work. In 2019, I got the most amazing opportunity to get back into conservation through the CREW programme where I have been coordinating the activities of CREW citizen scientists on the Cape Peninsula, Cape Flats and Agulhas Plain.

Sadly, the situation with Gladiolus aureus *is dire and we could not relocate the plants. The forecast for the survival of this enigmatic species is quite bleak as the site is heavily degraded and any attempts to restore the population will be extremely challenging.*

Cape Peninsula highlights and lowlights

The most amazing highlight was being back in the field, tracking down and recording populations of rare and threatened plants found on the Cape Peninsula.

Figure 1: CREW members who joined in on a Cape Peninsula trip.

The Peninsula CREW did not make any ground-breaking discoveries but we monitored many of the species on our annual target list. We did a total of 12 trips with the CREW Peninsula volunteers focusing mainly on the Table Mountain National Park and a few privately owned nature reserves. We recorded 61 species of conservation concern, consisting of four CR, nine EN, 17 VU, 16 NT and 15 Rare species.

My first Peninsula trip was with the Flora Documentation Program (FDP), of which most of the members also form part of the Friends of Silvermine. A group of 13 CREW volunteers joined in and we found 12 species of conservation concern.

Wendy Paisley, who many of you will know, has become a very active member of the Friends of Lions Head. She has been arranging hacks and litter clean-ups rallying the friends group to take care of the mountain. In September she organised a trip to search for *Polycarena silenoides* (CR) which was rediscovered by Gigi Laidler in 2015. The plants were not seen in 2016, but they made a welcome return in 2018.

One of the most exciting trips was to explore Sirkelsvlei in the Cape Point section of the Table Mountain National Park. This area is well known as one of the plant hotspots in the reserve and our target species was *Cytinus capensis* (CR). While searching for this we came across 21 other species of conservation concern, including *Arctotis angustifolia* (CR), *Babiana villosula* (EN), *Gnidia penicillata* (NT) and *Muraltia thunbergii* (NT) to mention a few. It was a very exciting moment for me when we eventually found *Cytinus capensis* (CR).

For the last few years CREW and the Millennium Seed Bank Programme (MSBP) have been working hard at strengthening the collaboration between the two programmes. We joined the MSBP in Hermanus on a seed collecting trip. We found *Brachysiphon rupestris* (Rare), *Erica nana* (VU), *Erica perspicua* subsp. *latifolia* (VU) and *Serruria heterophylla* (EN), as well as 13 other species of conservation concern. We focused on collecting population data and the MSBP team collected seeds of these species.

Towards the end of August, I planned a trip to search for *Gladiolus aureus* (CR). This species is only known from a handful of plants above Oceanview. We had 21 people join us for the trip and this illustrated the great interest in this species. Sadly, the situation with *G. aureus* is dire and we could not relocate the plants. The forecast for the survival of this enigmatic species is quite bleak as the site is heavily degraded and any attempts to restore the population will be extremely challenging. We will be working closely with all the interested parties including SANParks, Kirstenbosch National Botanical Garden and the City of Cape Town to come up with an amicable solution to saving the species.

Figure 2: *Dasispermum perennans* found at Sandy Bay.

My final CREW Peninsula trip for the year was to Sandy Bay, where Ismail asked me to search for *Dasispermum perennans* (EN). Three CREW volunteers and I took on the challenge and set off to Sandy Bay. After a long search in the field we had almost lost hope of finding the plants when we back-tracked onto the path and found the plants on our way back to the vehicle. We headed back along the path and found 52 plants.

We need to continue conducting searches for species of conservation concern. We have a list of all the species that have not been monitored by CREW yet and our mission is to find and conserve all those species. Remember that perseverance pays off, let's continue doing what we do best and help conserve our South African flora.

A 180° turn in the right direction

Leandra Knoetze

'Nature is not a place to visit – it is Home.'

This quote from Gary Snyder pretty much sums up my time with CREW thus far. A love of nature, the outdoors and conservation has always been in my blood. Working with CREW is an absolute pleasure and feels like a sort of coming home to me.

Growing up and studying in the Highveld (North-West Province) and obtaining my M.Sc. degree in Environmental Sciences – with my Master's project mainly focussing on botany (tree species), could only partially have prepared me for what awaited on the other side of South Africa. I started off my journey at SANBI in Cape Town as an intern in the Biological Invasion Directorate, where my main tasks were helping with the National Status Report on Biological Invasions, updating databases and other administrative work. However, knowing myself and my desperate need to be in nature and the outdoors, I volunteered to do field trips with CREW whenever the opportunity arose.

Being familiar with grasslands and trees, as well as fieldwork in Highveld areas, and then suddnely being surrounded by magnificent fynbos and mind-blowingly beautiful wildflowers made me realise that I had made a 180° turn as a botanist. With literally no knowledge of fynbos, I had to start over. From my first trip with CREW, I absolutely loved it and realised that it is never too late to start over. I took inspiration from Gigi who was also re-inventing herself as a botanist. My eagerness to learn more about fynbos and wildflowers grew over time and my knowledge of fynbos increased with every fieldtrip. So, my heart's desire was to work with CREW on a full-time basis. After my internship I did not know what I was going to do next, even though I applied for many different positions at SANBI. I was, therefore, so excited to hear that I got the SANBI internship with the CREW programme, that would allow me to address my passion and love for nature in my job.

A love of nature, the outdoors and conservation has always been in my blood. Working with CREW is an absolute pleasure and feels like a sort of coming home to me.

I was assigned to the Critical Habitat Species (CHS) project in the Northern Cape to do plant monitoring in this under-sampled province. The year kicked off with a bang, seeing that everyone had to help identify observations from the iNaturalist City Nature Challenge and also help Ismail prepare for the annual CREW Cape Floristic Region workshop. Soon after the workshop, I planned my first two-week trip to the Northern Cape in search of my critical habitat species. Everyone warned us not to go, seeing that it was so dry, but it proved to be a successful trip. We had around 267 species sightings, which included 12 threatened species and five CHS found, including *Oxalis ericifolia* (Critically Rare) and *Conophytum stephanii* (VU). I was blown away by the desolute environment that was seemingly devoid of all plants, but if you look carefully you will find the most adorable succulents and a rich diversity of plants. Moreover, my absolute highlight was finding *Conophytum smorenskaduense* (VU) in full bloom, resulting in a mountaintop filled with charming little pink flowers.

It was also during this first trip, that I discovered the extensive amount of succulent plant poaching and horrors surrounding the decline of our precious

Figure 1: *Conophytum smorenskaduense* (CHS) with its beautiful pink flowers.

Figure 2: Counting *Conophytum* species on the edge of a cliff in the Richtersveld.

Figure 3: Richtersveld after a little rain in August.

biodiversity, especially in this province. People from all over the world are illegally collecting plants in the wild. There is not much awareness of the issue as many people only think of rhinos, elephants or abalone when poaching is mentioned. Some plant groups like *Conophytum*, *Avonia*, *Monilaria* and *Lithops* are highly targeted by collectors. This made me realise how important it is to do long-term monitoring on our succulent species and create awareness about these issues.

I did a second trip to the Richtersveld in August where we visited Ploegberg. I joined Pieter van Wyk, who has been working and living in the Richtersveld for more than 18 years and has built up extensive knowledge of the plants in the area. Furthermore, during this week we saw around 242 different species, of which 27 were on our target list and two were CHS.

CREW has given me an opportunity to increase my plant knowledge, meet amazing people and travel to exciting botanical hotspots. Vincent van Gogh said, 'If you truly love nature, you will find beauty everywhere…' and from my time with CREW I know that I truly love nature, because the beauty of God's creation surrounds me daily.

The autumn aster – gloom or bloom?

By Janine Steytler

It is no secret that the Cape Floristic Region (CFR) is scattered with botanical treasures – some to marvel at, some to brag about, and some that are in dire need of conservation. The autumn aster is one of those that have been greatly affected by many factors including climate change, habitat destruction and alien invasive species. It is a species that has been mostly overlooked due to its inconspicuous characteristics and highly localised habitat. *Marasmodes undulata* is classified as Critically Endangered according to the IUCN Red List. During our last monitoring event we only recorded three plants and this area has since burnt, so we are unsure of its current status. This was the motivation for writing a proposal to the

Figure 1: Planting *Marasmodes undulata* seeds.

Mohamed Bin Zayd Species Conservation Fund (MBZSCF) to help save this species from extinction.

The autumn aster was first discovered in Paarl Valley in 1946. It occurs on the fringe of two highly threatened vegetation types of South Africa known as the Swartland Shale Renosterveld and the Swartland Alluvium Fynbos. The joining of these two vegetation types have ensured the perfect conditions for the habitat of this species and the last remaining fragment of its habitat is located within a campsite in Paarl. The campsite is regularly visited by the community for recreational purposes. Previously it was used as a dumping site, before the importance of this four hectare piece of vegetation was acknowledged as highly important and of conservation concern. The history of the autumn aster is fragmented and vague due to the lack of collection and surveys, as well as the inconspicuous habit of this species.

Although unclear, the history of occurrence of *Marasmodes undulata* gives clues as to how the species' survival has become so desperate, and may help in understanding how conservationists may approach the restoration of this little member of the Asteraceae. After the first discovery in 1946, records seemed to disappear off the map and it was assumed that the autumn aster had gone extinct. This was until prominent botanist, Chris Burgers, from CapeNature rediscovered a small population at Orleans Park in Paarl in 1980. The handwritten field notes, which are now in the possession of CREW at Kirstenbosch, reveal that the population stood at 200 individuals and already concerned botanists to the point of involving the Drakenstein Municipality and universities to conduct

Following a late year burn at Orleans Park in 2018, it was discovered that no plants had recruited after the fire and Marasmodes undulata *could possibly be extinct.*

more research on the fate of the species. In 2005 CREW got involved and started monitoring the population more intensively, which had by this time declined to a mere 25 individuals. In 2011 only 17 plants were found. The decline in individuals had become more serious and by 2018 less than ten individuals were present. Following a late year burn at Orleans Park in 2018, it was discovered that no plants had recruited after the fire and *M. undulata* could possibly be extinct.

Through the funding received from the MBZSCF we aim to propagate *Marasmodes undulata* from seeds stored in the Millennium Seedbank (MSB) and improve the condition of the site by doing active restoration of degraded areas. The restoration of the site has been ongoing by monitoring all plant species on site, including 22 other threatened species that occur there, removing alien species such as Port Jackson wattles and Paterson's curse, and visiting regularly to remove rubble, litter and the leftovers from parties and gatherings. A strong relationship with the Drakenstein Municipality has been cultivated and Orleans Park is in the process of being proclaimed as a stewardship site, which will bring hope for both *M. undulata* and botanists alike. Although our initial germination of

Figure 2: *Marasmodes undulata* flower.

Figure 3: Monitoring Orleans Park in bloom.

M. undulata was unsuccessful (from seeds that were stored in a South African repository) we have learnt valuable lessons about the cultivation of this species and when the pristine seed collection arrives from the MSB we will have a greater chance of success.

The restoration of Orleans Park and the autumn aster not only highlight the importance of conserving species and vegetation types within the CFR, but also the importance of awareness around the effects of climate change and alien invasive species in biodiversity as a whole. Through combining efforts from both conservationists and the community, so much more can be brought to light than just the survival of a species – the work of community, education around biodiversity, the importance of biodiversity to livelihoods and general interest in the natural areas that surround us can and do add value to our lives.

From Limpopo to the Western Cape – the adventure continues...

By Mulalo Munarini

I grew up in a rural area in Limpopo Province, where we depended on nature for food, shelter and medicine. We benefited a lot from trees. Because of that, I knew I wanted to do something related to conservation and the study of plants. I used to listen to my grandmother's stories of how the family relied on nature, and this inspired me to protect the resources that have allowed me and my family to survive for generations. It has been this legacy that has pushed me to pursue a career that would enhance appreciation of the surrounding environment and the ecosystem.

I completed a BSc degree in biochemistry and biology and an honours degree in botany at the University of

Figure 1: Mulalo Munarini conducting a mini bioblitz in Nieuwoudtville. Photographer: Albert Koopman.

This opportunity enabled me to gain insight and experience on how best to contribute to monitoring, conserving and management of South Africa's rich plant biodiversity.

Venda. My honours research was based on surveying medicinal plants used to treat pneumonia in the Vhembe region in Limpopo Province, where I worked with the traditional healers and other local stakeholders. I learned a lot about medicinal plants and the different harvesting methods.

After my honours degree, I moved to the Western Cape where I am currently completing my MSc degree in forestry and natural resources science at Stellenbosch University. The topic of my project is to develop a conceptual framework for payment of environmental services in South Africa's plantations. The purpose of my project is to explore the best approach in minimising the negative impacts on the environmental services through a Payment of Environmental Services (PES) scheme – an attractive conservation tool used to preserve and restore environmental services. Many forestry owners around the world are acting on conserving and restoring important environmental services in this way. This scheme is used to conserve the environmental services in the plantation forests by rewarding the forest owners for conservation efforts and penalising plantation forests for the damages that they may cause to the environment.

In April 2019 an opportunity was presented and I was fortunate to land a World Wide Fund for Nature (WWF) environmental future leaders' internship,

Figure 2: Mulalo Munarini in the mountains near McGregor. Photographer: Joti Daya.

where I was placed as a conservation scientific officer intern with the CREW programme. I was empowered by the learning I gained through practical work. I learnt a lot from my mentors (Ismail Ebrahim and Dewidine van der Colff) about identifying plant species in the field. This opportunity enabled me to gain insight and experience on how best to contribute to monitoring, conserving and management of South Africa's rich plant biodiversity.

My highlight was being part the long-term monitoring of threatened plants by citizen scientists project, where I have been assisting Dewidine van der Colff with preparing a research paper focussed on

Figure 3: Mulalo Munarini with Alouise Lynch, Keir Lynch and Joti Daya during a field trip to Caledon. Photographer: Cian Lynch, Bionerds.

understanding the role of CREW volunteers in long-term monitoring in South Africa, in comparison with other monitoring projects. My work included collating data and editing some sections of the paper.

Another great opportunity was to be part of Nieuwoudtville Winter School where I got an opportunity to plan and interact with learners and teach them about the importance of biodiversity and the need to protect our plants.

A fulfilling experience for me was having to plan and organise a field trip to the beautiful Caledon area where we managed to find a threatened species, *Moraea barnardii* (CR) which we thought had been permanently lost by the resurfacing and widening of Shaw's Pass. Fortunately, we found a small population on an adjacent farm that is currently in negotiation to become a stewardship nature reserve.

Through all of these experiences I have acquired various skills, from how to analyse data to time management and my writing skills have also improved. I have also acquired the skill to drive a 4 × 4 in harsh terrain. I appreciate the platform that was given to me to learn and I am positive that this experience has enriched my career path to become a conservation scientist.

Saving Critically Endangered Cape Flats Sand Fynbos from extinction at Tokai Park section, Table Mountain National Park

By Megan Smith

'One of the penalties of an ecological education is that one lives alone in a world of wounds.' – Aldo Leopold.

This is a thought that has stayed with me during my internship while implementing a research project centred on the restoration of Critically Endangered Cape Flats Sand Fynbos at Tokai Park, supervised by Dr Tony Rebelo. My academic background is mostly based in evolutionary and pollination ecology, but the project (and Tony) has inspired me to continue onto completing a PhD focusing on restoration of highly threatened ecosystems in the near future. Ecosystem conservation in urban landscapes is an extremely difficult task to undertake and often results in conservationists coming second, but doing research at Tokai Park has also given me hope that, with time, effort and collaboration, threatened vegetation types can be effectively restored and managed.

Cape Flats Sand Fynbos is the most species rich of all the Sand Fynbos types, but the most iconic species it protects must be *Erica verticillata* (EW), which is extinct in the wild. However, *Erica verticillata* is only one of the 108 species of conservation concern that is wholly confined to Cape Flats Sand Fynbos, other species include *Leucadendron levisanus* (CR), *Serruria aemula* (CR), *Serruria foeniculacea* (CR), *Serruria furcellata* (CR), *Lampranthus stenus* (EN), *Ixia versicolor* (CR) and *Tetraria variabilis* (DDT). It also conserves endemics such as *Aspalathus variegata*, *Erica pyramidalis*, *Liparia graminifolia* and *Erica turgida* which have been wiped out as a result of habitat destruction and degradation and are now formally extinct.

Besides conserving a wide array of plant species, Cape Flats Sand Fynbos is a lowland vegetation type resulting in dips and depressions throughout the landscape filling up with water during winter. This is not only necessary for the conservation of water tables, but also creatures that depend on this water as a refuge from the urban surrounds such as the

Figure 1: Unburnt areas are usually species-poor and have been invaded by bird-dispersed species. Photographer: Tony Rebelo.

Critically Endangered microfrog (*Microbatrachella capensis*) and Endangered western leopard toad (*Amietophrynus pantherinus*).

Unfortunately, Cape Flats Sand Fynbos is also the most threatened vegetation type within the City of Cape Town and high on the list of conservation priorities. It used to be the most widespread of all vegetation types in Cape Town, but is now only confined to a few fragments scattered across the city. The national conservation target of 30% (required to conserve 70% of Cape Flats Sand Fynbos plant species) is unattainable as only 10% remains. This implies that remaining areas of Cape Flats Sand Fynbos should be protected and restored if we are to reach our national targets. Despite this, the remaining Cape Flats Sand Fynbos continues to be highly threatened mostly by invasive trees and grasses, and destruction caused by housing developments.

Tokai Park is very close to my heart because it contains one of the largest areas available to restore Cape Flats Sand Fynbos. Even though the area was under pine plantations for over 100 years, an accidental fire in 1998 revealed that there may still be signs of fynbos under the pines. The amazing recovery of the natural veld lead to an agreement between SANParks and forestry stipulating that all the pines will be harvested by 2025.

Lower Tokai is only about 152 hectares in size, but over 400 species of Cape Flats Sand Fynbos plants have been recorded at Tokai Park so far, 22 of them threatened with extinction.

Since the start of the pine felling, the restoration success of the area has been remarkable. Lower Tokai is only about 152 hectares in size, but over 400 species of Cape Flats Sand Fynbos plants have been recorded at Tokai Park so far, 22 of them threatened with extinction. Pristine reference patches are unavailable for comparison, but Purcell's historical records from the neighbouring Bergvliet Farm, list 615 plant species that provide focus for restoration efforts. Owing to the high number of threatened species within Tokai Park, it is considered one of the most important Core Conservation areas in Cape Town.

Figure 2: Burned areas have a high abundance and cover of perennial indigenous graminoids (restios and sedges) and ericoid shrubs. Photographer: Tony Rebelo.

Figure 3: Landscape of lower Tokai Park showing some of the naturally recovered areas of fynbos. After pines are felled, the area should be burned to encourage the indigenous fynbos species to germinate.

The effects of pine plantation management (species, number of rotations and length of longest cycle) and restorative fire management (unburnt, cool and hot fires) on recovery are the current questions we are trying to answer as part of my internship. The findings from my internship (and other interns before me) will form part of a 10-year project, the Tokai Restoration Project, between SANParks and SANBI researchers. Plant richness is significantly higher in areas with hot fires compared to areas that are unburnt. Hot fires reduce alien invasive grasses (predominantly Mediterranean species such as *Briza*) and flush *Acacia* seed banks, requiring urgent clearing. Species with long-lived seed banks (e.g. *Wiborgia* and *Virgilia*) and bird-dispersed species (e.g. *Chrysanthemoides* and *Searsia*) have high abundances in areas that had long (~60 years) pine cycles and cool fires. Some threatened species (e.g. *Serruria fasciflora* and *Diastella proteoides*) are largely associated with hot fires and short pine cycles. Two guilds are largely absent from the seed banks: resprouting shrubs and overstorey plants with canopy-stored seed banks (largely *Leucadendron* and *Protea*). Attempts at restoring the latter with locally collected seeds sown post fire have been successful, but plantings of threatened and resprouting species have been met with mixed success – with heavy mortality during drought years.

A few lessons have been learnt concerning the restoration and conservation of Cape Flats Sand Fynbos at Tokai Park. Firstly, there is a dire need for collaboration between stakeholders and partners (principally Table Mountain National Park, SANBI, Kirstenbosch, Working for Water, Friends groups and other organisations). This collaboration involves communication and coordination to avoid local disasters such as fire belts through new plantings or applying herbicide carelessly. Secondly, each stakeholder should also encourage the use of volunteers to collect valuable biodiversity data. Over 10 000 observations have already been recorded by citizen scientists on iNaturalist.

However, one of the most critical factors concerning the restoration and management of Cape Flats Sand Fynbos remains proper fire management. Hot fires contributed immensely to the successful recovery of natural vegetation. Unfortunately, legal and capacity issues require fires to be cool or in the wrong season for fynbos (i.e. autumn or winter). Fire in urban conservation areas will be one of the largest obstacles for the restoration and management of Cape Flats Sand Fynbos in the foreseeable future.

If you would like to know more about the Tokai Restoration Project, please feel free to contact Tony: T.Rebelo@sanbi.org.za. This article has been adapted from the Re-story article. The full article can be found here: https://restory.co.za/2020/01/13/passive-restoration-of-critically-endangered-cape-flats-sand-fynbos-at-lower-tokai-park-section-of-table-mountain-national-park-cape-town/.

Local expertise yields successful results in locating our species of conservation concern

By Vathiswa Zikishe

The proverb, charity begins at home, is generally used in a home setting where its meaning is associated with a person's first responsibility for the needs of their own family and friends. However, this can also be taken into a different context, such as using one's expert knowledge to plough back to your community or region, as in the case of the story I'm about to tell.

At the beginning of 2019, the core CREW Eastern Cape team, consisting of local botanists, herbarium staff, students and BotSoc members, started a group which we now call the Wednesday group, as we mostly chose Wednesdays to go out and search for a species on the 'CREW hit list'. Our first search was for that of *Searsia albomarginata* (CR), a morphologically distinct species in the genus, yet difficult to find. Since the inception of the CREW Eastern Cape Node, this species has always been on our priority list to search for, but previous endeavours to locate it failed, due to lack of access and vague locality information in some instances.

A brief history of *Searsia albomarginata* and what led to its recent discovery

Rhus albomarginata (now *Searsia albomarginata*) was first described in the first volume of *Flora Capensis* in 1860 by German botanist, Otto Wilhelm Sonder. His revision cited two specimens; one from Slaykraal, now known as Slaaikraal, and one from the eastern banks of the Kowie River. In 1930, Selmar Schonland revised the genus and noted how very rare this species was. In his revision he added a new collection from Sidbury, which is 30 km west of Grahamstown (now Makhanda). In 1955, Derek Commins discovered a new locality at Mill Hills Farm, 20 km west of Grahamstown (now Makhanda), which is now the fourth locality for this species.

Armed with this information, we then followed in the footsteps of the former collectors, but focused on the type specimen from Slaaikraal and Mill Hills Farm, as these can be searched for in a single day due to the localities' proximity. One of our group members,

Figure 1: Team examining the first bush of *Searsia albomarginata*. Photographer: Vathiswa Zikishe.

Figure 2: *Searsia albomarginata* flowers. Photographer: Craig Peter.

Figure 3: Vathiswa Zikishe in the beautiful Eastern Cape Drakensberg landscape. Photographer: Brendan Cole.

Tony Dold, had been to Mill Hills in the late 1990s, but was denied access beyond the road reserve, which, unfortunately, is where the 1983 map had indicated the occurrence of the species. Our searches at Slaaikraal were unsuccessful, similar to the more recent searches by Rodney Moffet in 1993 for his revision of the genus. However, we were successful at Mill Hills, locating the species after almost 40 years since its last collection!

This motivated the Wednesday stars, as we now call each other, to do more searches of this kind, and this led to two more successful finds: *Apodolirion amyanum* (EN) and *Merremia malvaefolia* (CR PE)!

More trips with our local experts

Based on the recommendations of the recently produced CREW programme review, the Eastern Cape Node has been focusing on undersampled areas of the Eastern Cape, namely the former Transkei region and the Eastern Cape Drakensberg. Again, the core CREW team played a role in planning for these, but the local champions for each region have been quite instrumental in the success to locate our targeted species. Brendan Cole, based in Rhodes near Barkly East, played a huge role and contributed enormously to iNaturalist by uploading over a thousand observations to date. His records include the endemics and species of conservation concern found in the alpine and montane grasslands of the Eastern Cape Drakensberg. Our biggest highlight of this region for the current field season is that of *Disa scullyi* (EN) and without Brendan's guidance on where to botanise near Rhodes, we wouldn't have been able to see this special plant. Tucked away in between the picturesque mountains, only those with an adventurous spirit and a love for plants would manage to hike the distance and gaze upon the beautiful flowers.

With Nicky McLeod and her team from Environmental and Rural Solutions (ERS), we had a successful day of botanising near the Lesotho border, where we located *Asclepias oreophila* (Rare), *Alepidea amatymbica* (EN) and *Schizochilus bulbinella* (Rare). Nicky and her business partner, Sissie Matela, heads up the multi-stakeholder NGO in Matatiele, leaving them with a lot on their plate. Nevertheless, she manages to juggle all her responsibilities and add something that she loves dearly: botanising the mountains. Her passion is infectious and it has rubbed off on their project coordinator, Tsoanelo Shata, who is now the go-to person when organising CREW activities in Matatiele. I can never overemphasise the inspiration I draw from spending time with their team, I feel rejuvenated, beaming with ideas to do more for plant conservation, after spending time with this crowd.

The power of local expertise has enriched our node in various ways, as you can tell from our story. We have done quite a lot and are growing stronger together towards the goal of conserving our rich floral heritage.

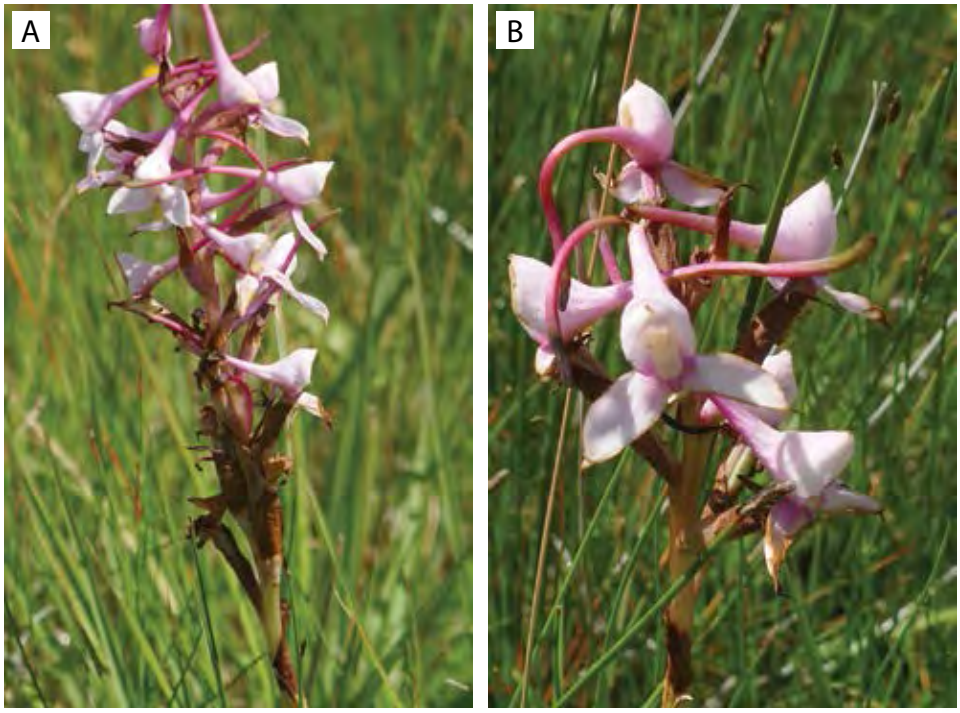


Figure 4: *Disa scullyi*: A, whole plant; B, flower close-up. Photographer: Vathiswa Zikishe.

Last but not least was our botanical trip with Thutani Mpunga, a guide in the Pondoland Coast region between Port St Johns and Lusikisiki and a member of the Wild Coast Forest Guide Association, whom we were introduced to by Sinegugu Zukulu. Thutani is passionate about keeping Pondoland as beautiful and as natural as it is and his indigenous knowledge related to plant use is exceptional. His keenness to learn more of the plants made the entire trip highly rewarding. Prior to our fieldtrip, Thutani made an effort to familiarise himself with the species we were targeting and, based on the locality information we provided, he devised an itinerary which maximised our success in surveying our target species – *Podranea ricasoliana* (VU), *Stangeria eriopus* (VU), *Eugenia verdoorniae* (NT) and *Leucadendron spissifolium* subsp. *natalense* (NT).

In closing

I would like to thank Prof. Cupido from the University of Fort Hare for enabling us to successfully

Figure 5: Thutani Mpunga and Sibahle Gumede collecting seeds. Photographer: Pamela Sgatya.

engage his students through a guest lecture, as well as the time spent with his colleagues while conducting fieldwork in Hogsback. The CREW Eastern Cape Node's engagements with four of our province's higher education institutions has now taken off, we look forward to strengthening our partnership and working more closely with local conservation agencies to achieve our common goals.

The power of local expertise has enriched our node in various ways, as you can tell from our story. We have done quite a lot and are growing stronger together towards the goal of conserving our rich floral heritage.

We are also ploughing back to our community in the form of education, please read Pamela Sgatya's story elsewhere in this newsletter.

Figure 6: *Apodolirion amyanum.* Photographer: Tony Dold.

The Fourcade Botanical Group's 17th year with CREW

By Caryl Logie

During 2019 a large sector of our community asked us many questions about plants. This has meant we could promote CREW and SANBI and all the work they do.

Our Fourcade Botanical Group (FBG) Juniors spent a very interesting afternoon on the coast with Sally, looking at the coastal vegetation and learning about our 'white gold'. The afternoon ended with them dissecting 'gold' – chokka.

We've hunted orchids with visitors from the Hermanus Botanical Society (some of whom have since joined CREW), enjoyed an iNaturalist course with Adriaan Grobler and found that the monitoring of *Brunsvigia litoralis* (VU), that we've watched for 10 years, was a little more encouraging – we observed more seedlings in 2019.

On a positive note, we did find new populations of Satyrium hallackii *subsp.* hallackii *(VU),* Brunsvigia litoralis *(EN),* Indigofera hispida *(VU),* Cussonia gamtoosensis *(Rare) and* Dioscorea sylvatica *(forest elephant's foot) (VU) during our 2019 field season.*

We were part of the team looking at the species in the Cape St Francis and St Francis Bay Nature Reserves. This resulted in Richard Cowling and Adriaan Grobler producing a peer-reviewed journal paper comparing the species traits of dune floras in similar ecosystems. (peerj.com/articles/7336). We are now fine-tuning our Honeyville Nature Reserve list of about 500 species for another possible article.

For the first time we recorded *Aloe pictifolia* (Rare) and *Bowiea volubilis* subsp. *volubilis* (climbing onion) (VU). This was incredible, because we have been botanising in the area for over 20 years and we are still finding species that we have not recorded there before.

We haven't found *Disa lugens* var. *nigrescens* (CR), but we found a colour variation of *Disa lugens* (VU) very close to where the former was originally found. We haven't given up and will continue searching for this elusive orchid.

Figure 1: Murray-John and Liyabona admiring a *Satyrium princeps*.

Figure 2: *Faucaria felina* brightening up our day.

On a positive note, we did find new populations of *Satyrium hallackii* subsp. *hallackii* (VU), *Brunsvigia litoralis* (EN), *Indigofera hispida* (VU), *Cussonia gamtoosensis* (Rare) and *Dioscorea sylvatica* (forest elephant's foot) (VU) during our 2019 field season.

We spent a worthwhile time together at Kleinrivier Wilderness which shares two boundaries with Groendal Nature Reserve near Uitenhage. Prior to the trip we all had homework to do in order to familiarise ourselves with the plants, geology and animals we hoped to see, and so be able to share interesting information with our group. On the way there we traced the routes of early botanical travellers and stopped to admire *Sterculia alexandri*, Cape star-chestnut (Rare) in flower, as well as Thunberg's cycad, *Encephalartos longifolius* (NT) and *Strelitzia juncea* (VU) which was just coming into flower. As a result of the severe drought, there was not a great deal of plants flowering at Kleinrivier, but the tiger's mouth, *Faucaria felina*, brightened up the dry, dusty earth and *Tritonia securigera* attracted our attention with its fascinating design ensuring that pollination takes place. When honeybees visit the flower they grab the yellow teeth on the lower lobes and crawl over them to reach the nectar. The gap they crawl through is just a little narrower than the bees and so they collect pollen on their backs and carry it to the next flower. While we were there, we were caught in a brief shower of rain which was just enough to bring out the Eastern Cape's giant earthworms – the longest was 1 400 mm.

We help environmental impact assessment specialists with plant lists and Wentzel Coetzer of Conservation Outcomes with site assessments prior to submitting the documentation required to declare new nature reserves.

We are not just a faint voice blowing in the wind, we are backed by CREW and SANBI and this enables us to make more people aware of our unique vegetation and the need to do everything we can to conserve it.

Figure 3: The team at a *Pappea capensis*, Kleinrivier Wilderness.

CREW Port Elizabeth 2019 report

By Adriaan Grobler

Like many areas in South Africa, 2019 continued to be an extraordinarily dry year in Nelson Mandela Bay and the greater Eastern Cape. To make the most of our botanising, we concentrated on the southern and eastern parts of the metro, closer to the coast, where the effects of the drought have been less severe. Much time was spent in coastal dunes – a habitat with a very high proportion of threatened plant species. During 2019, we recorded a total of 18 species of conservation concern here, including *Achyranthemum sordescens*, *Agathosma stenopetala*, *Arctotis elogata*, *Aspalathus recurvispina*, *Erica chloroloma*, *Erica glumiflora*, *Eulophia speciosa*, *Gladiolus gueinzii*, *Hyobanche robusta*, *Indigofera tomentosa*, *Moraea australis*, *Othonna rufibarbis*, *Pelargonium suburbanum* subsp. *suburbanum*, *Psoralea repens*, *Rapanea gilliana* and *Satyrium princeps*.

Despite the drought and scorching heat, we ventured further inland in March, when Vathiswa Zikishe and Tony Dold joined us outside of Uitenhage to survey a newly discovered population of Critically Endangered *Aloe bowiea*. This dwarf aloe is endemic to Nelson Mandela Bay, growing in rocky clay soils in natural clearings between dense thicket vegetation. Other species of conservation concern that occur here include the dwarf succulents *Euphorbia globosa* and *E. meloformis*, and the Critically Endangered geophyte *Ledebouria coriacea*.

During the cooler months of the year, we visited lowland fynbos areas in the west of Nelson Mandela Bay, where several species are threatened by urban expansion and alien plant invasions. Species we encountered include *Agathosma hirta*, *Argyrolobium crassifolium*, *Aspalathus intermedia*, *Corpuscularia*

Returning to the coastal dunes, we were very happy to find a healthy population of the Critically Endangered dune endemic Aspalathus cliffortiifolia, *previously considered to possibly be extinct, in the Nelson Mandela University Nature Reserve – the only population of the species occurring in a protected area.*

Figure 1: Vathiswa Zikishe and Tony Dold searching for *Aloe bowiea*.

Figure 2: New population of *Aloe bowiea*.

Figure 3: Critically Endangered *Aspalathus cliffortiifolia*.

lehmannii, *Erica zeyheriana*, *Gymnosporia elliptica* and *Haworthiopsis fasciata*.

Returning to the coastal dunes, we were very happy to find a healthy population of the Critically Endangered dune endemic *Aspalathus cliffortiifolia*, previously considered to possibly be extinct, in the Nelson Mandela University Nature Reserve – the only population of the species occurring in a protected area. We also came across two previously unrecorded populations of the Near Threatened vygie *Mesembryanthemum vanrensburgii* along the rocky shores south of Port Elizabeth. This species was previously thought to be restricted to the stretch of coast between Hawston and Agulhas in the Western Cape, about 550 km to the west of the newly recorded populations.

We look forward to another year of monitoring and hopefully some rain to alleviate the drought.

CREW Eastern Cape node prioritises raising plant awareness

By Pamela Sgatya

I am a Groen Sebenza intern, based at the CREW Eastern Cape node, and currently residing in a small town called Bathurst – renowned for its big pineapple museum, the world's largest pineapple-shaped building standing tall at 17 m, developed in the 1980s by the town's agricultural community to pay tribute to the fruit that forms a significant part of the local economy. Growing up appreciating plants from my grandmother's nursery and school trips to nature reserves, led me to pursue a career in botany. I enjoy studying growth patterns of plants; hence I would like to continue my studies with a focus on vegetation disjunction.

During this first year of my internship, I have gained a wealth of knowledge, learning about plant ecology, threats to the biodiversity, community engagement and the value of environmental education. On my way from work one afternoon, I explained the importance of my job with respect to conservation and a comment, that revealed the lack of exposure to environmental issues amongst the Bathurst community, was made. This prompted me to focus on environmental activities to build awareness about South Africa's flora amongst school pupils in the Bathurst community.

Relaying this vital information may inspire pupils to become more aware of the alien invasive plants occurring in their area and inspire them to initiate clearing activities.

There is a saying in IsiZulu, *Ligotshwa lisemanzi*, which means bending the stick while it is still wet. I conducted botanical activities with learners from two schools in Bathurst (Qhayiya Primary and Velile Secondary) in a bid to instil an appreciation for biodiversity. I taught them about the importance of plants, factors threatening plants and what conservation measures are taken to avoid the threats leading plants to extinction. Engagement between the two schools was great! The pupils showed interest during the presentations. They were excited to learn new things about plants and that some aspects of the plants they knew were factors that made them important for

Figure 1: Fascinated pupils at Qhayiya Primary school during the plant awareness presentation. Photographer: Vathiswa Zikishe.

Figure 2: Velile Secondary school plant awareness presentation. Photographer: Amanda Mkrakra.

conservation. One pupil from the primary school was surprised to learn that some plants occurring in South Africa are not originally from our country. Relaying this vital information may inspire pupils to become more aware of the alien invasive plants occurring in their area and inspire them to initiate clearing activities.

A competition for best future arborist was formerly introduced at the primary school with grade six pupils in October 2019. Pupils were encouraged to plant indigenous trees at their school, to increase biodiversity by creating more habitat for animals like birds, and provide much needed shade and wind breakers. Due to time constraints, the high school planted their trees in my absence. The tree species planted were *Sideroxylon inerme* (2), *Olea africana* (2) and *Hippobromus pauciflorus* (1) all holding a conservation status of Least Concern. Apart from watering the newly planted trees, the pupils continued to

Figure 3: Qhayiya Primary learners: A, watering *Sideroxylon inerme*; B, planting *Olea africana*; C, dropping cow dung on *Olea africana*. Photographer: Pamela Sgatya.

nurture their trees by dropping cow dung around the trees, indicating that they will take good care of them. The project will continue for a year, during which time I will conduct site visits to assess the growth of the trees on a quarterly basis to decide on a winner for the competition. My first visit after planting the trees was in the first week of February 2020.

I extend my warm gratitude to the Subtropical Thicket Restoration Project (STRP) at the Waainek tunnels, Rhodes University for donating the trees and the schools for making this project happen.

Figure 4: Qhayiya Primary school plant awareness day. Photographer: Vathiswa Zikishe.

Ain't no mountain high enough for Streaky

By Kaveesha Naicker

The 2019–2020 field season sped by like the Flash on steroids, with Fall Out Boy on the radio, Streaky (our trusty bakkie) and us girls travelling across KwaZulu-Natal, searching for 32 plant species of conservation concern, in the span of 40 planned A-Team fieldtrips. It has been quite a ride thus far and I've enjoyed every second of it.

Across the summer rainfall region, we scheduled a total of 119 fieldtrips in order to search for the targeted species of conservation concern. CREW KwaZulu-Natal Node, the central hub for the summer rainfall region, prioritised species according to their Red List statuses, focussing primarily on species listed in the Threatened categories: Critically Endangered (CR), Endangered (EN) and Vulnerable (VU).

Figure 1: Streaky and the 12 apostles. Photographer: Hlengiwe Mtshali.

I returned to KwaZulu-Natal more inspired and filled with ambition, to expand my botanical skills. I spent many days after that weekend debating my five favourite plants – to be honest, I've yet to narrow it down to just five!

For me, the tone of much of this field season was set by the Plant Specialist Group's talk in October of 2019 at Buffelskloof Private Nature Reserve, and I sincerely thank them for the opportunity to attend. The body of knowledge exchanged was immense and speakers outlined their botanical interests clearly and scientifically. I returned to KwaZulu-Natal more inspired and filled with ambition, to expand my botanical skills. I spent many days after that weekend debating my five favourite plants – to be honest, I've yet to narrow it down to just five!

We began this field season, with the Durban CREW group, visiting Kranzkloof Nature Reserve on a very humid morning, searching for *Geranium ornithopodioides* (EN) at Nkutu River Gorge. We surveyed the threatened KwaZulu-Natal Sandstone Sourveld grassland, but the species was nowhere to be seen. It was our first outing for the field season and I suppose at

this stage it hadn't rained sufficiently for the flowers to be in bloom. Nevertheless it was an eventful day as we spent a few moments sheltered beneath forest cover evading a swarm of bees that trailed us.

Our eclectic mix of music and *Guide to plant families of Southern Africa*, formed two key components of this field season, keeping us energised and enthusiastic on those long drives. The road to Wakkerstroom in late November was indeed a long one, but the views across the Wakkerstroom montane grasslands were incredible. The delightful town seemed like a little piece of paradise, with spectacular landscapes, welcoming people, singing birds and remarkable wildflowers. It's always a pleasure spending time in the field with the Maxteds from the Wakkerstroom CREW group. The visits I have made there over the past two field seasons have left me with treasured memories. On our latest trip we targeted *Xerophyta vallispongolana* (VU), *Aloe hlangapies* (VU) and *Afroligusticum wilmsianum* (VU) and were fortunate to survey undersampled areas in Groenvlei and Paulpietersburg.

During this past field season, I've learned that rushing determinedly into grasslands seeking CREW target species sometimes doesn't work. Slowing down, pacing oneself while enjoying a good cup of tea amid the picturesque views, is an effective way of recalibrating after enduring the heat of the day – and occasionally that's when you will look again and stumble upon the target species.

December 2019 was full of activity, particularly when we joined the Pondoland CREW group on an outing to Jolivet, west of Park Rynie. This fieldtrip was one of my favourites from this field season – I was mesmerised by the fields of Apocynaceae species we

Figure 2: *Xerophyta vallispongolana* (VU).

came across, *Pachycarpus concolor* subsp. *concolor*, *Pachycarpus acidostelma*, *Schizoglossum bidens* subsp. *bidens*, *Asclepias bicuspis*, *Asclepias cultriformis*, *Asclepias albens* and *Xysmalobium involucratum* – all within a 200 m radius!

The group also treated us to a treasured little site where we were fortunate to observe the previous Critically Endangered Possibly Extinct species *Riocreuxia flanaganii* var. *alexandrina*, now listed as Critically

Figure 3: Durban CREW group and Aaliyah after a humid day at Kranzkloof Nature Reserve.

Figure 4: *Pachycarpus acidostelma.*

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Figure 5: *Asclepias bicuspis.*

Figure 6: *Riocreuxia flanaganii* var. *alexandrina* (CR).

Endangered on the Red List of South African Plants. Being with the Pondoland group is always an educational experience, especially with Kate and Graham Grieve demonstrating the various interesting and unique features of specific threatened plants. Their willingness to share their knowledge is so generous and I find myself more intrigued by the botanical realm after every field trip I share with the Pondoland group.

We usually have a little cross-pollinating between the groups and this field season was no different. Members of the Durban and Underberg CREW groups joined forces with the Midlands group for an unforgettable day at the Ivanhoe farmstead in the Midlands. The day, captioned as a CREW mini-workshop, was simply amazing with blue skies and fields of pretty Gladioli – *Watsonia pillansii*, *Hermannia cristata* and *Sandersonia aurantiaca* – being observed. This trip was unforgettable for many reasons, but personally, I was happy that Dave Raulstone could join us. After everything he has been through in 2019, seeing him in good spirits and enjoying the day's outing was priceless. It was quite a marvellous way to end a year of many challenges and frenzied moments that came our way.

Sliding into 2020 the right way, we visited Hodgsons Peak once again to look for *Helichrysum pagophilum* (Rare) as part of our Berg project. Our journey was quite eventful; the misty drive up Sani Pass's rocky terrain really tested my driving skills. Having been up the pass a few times, I've been fortunate to observe the astounding Berg endemics so it is truly saddening to see the impact of the recent road expansions on these beauties in their natural habitat. We came

Figure 7: Ivanhoe group photo. Photographer: Mark Campbell.

across a plant that fit the description of *Helichrysum pagophilum* on Hodgsons Peak South (at 3 100 m altitude) after a long, tiring hike. However, Asteraceae species aren't always kind to me, so my confidence is diminished. We are currently waiting for SANBI's *Helichrysum* specialist to verify the identification – fingers (and toes) crossed that we've found it this time.

The last field trip I went on was part of CREW's Maputaland project. It was quite ambitious with the goal of ten target species in five days. We were fortunate to be joined by SANBI's *Thesium* and Fabaceae specialists, Natasha Lombard and Marianne le Roux, Mozambican PhD student Hermenegildo Matimele, as well as fellow CREWites Francois du Randt and Kevin Jolliffe. We visited the cliffs of the Jozini mountain pass, Ndumo Game Reserve, Tembe Elephant Park, the grasslands of Ozabeni, as well as Lake Bengazi. I'm glad to report that we survived the 44 degree Celsius temperatures and the tick and mozzie attacks and succeeded in locating seven of the ten species we were looking for. Finding *Thesium polygaloides* was most definitely the highlight of this trip. After days of scouring depressions, we found the plant living its best life in a vlei near the swamp forest.

CREW is certainly more than just a group of individuals collecting botanical data for conservation. This is evident through the multiple disciplines that are influenced by the CREW programme's work. We are huge supporters of human capital development initiatives, encouraging South Africa's youth to participate in conservation awareness building activities (evident in our interns' articles). CREW is an active contributor towards provincial biodiversity stewardship programmes by providing guidance regarding

Figure 8: Jozini Dam.

the botanical component of the environmental assessments. In KwaZulu-Natal, we work closely with Conservation Outcomes and Ezemvelo KZN Wildlife towards surveying stewardship sites. This past year, the CKZN team assisted with four stewardship assessments, mostly in the west of the province apart from the post-proclamation site visits undertaken by some CREW groups.

We appreciate everything that our CREW citizen scientists do to ensure that we receive updated data sets; thank you for making the 2019–2020 field season the success that it was. To my CREW KwaZulu-Natal squad, thanks for all your assistance during the field season, for being patient with me as I extended planning meetings and fieldtrips – but, most of all, thank you for never saying that my singing was out of tune.

Figure 9: *Thesium polygaloides.*

Pondoland group

By Kate Grieve

To meet CREW's mandate, we have tried to achieve a balance between monitoring our flora, promoting awareness and conservation, and reducing the threats posed by invasive alien species.

Monitoring and target species

The 2019 year started with a trip to the Ongeluksnek Nature Reserve near Matatiele to update the plant list for the reserve. This remote, tranquil spot is well worth visiting and there was plenty to see in the high-altitude grasslands burned the previous season. A visit to Vernon Crookes Nature Reserve in February was very productive, we found, amongst other *Brachystelma gerrardii* (EN), additional localities for *Riocreuxia flanaganii* var. *alexandrina* (CR) and swathes of scarlet *Indigofera* sp. nov. '*gogosa*'. In early spring we joined the Durban CREW team at Highflats where we found our target species, *Pachycarpus acidostelma*, along with several different Apocynaceae species and also *Argyrolobium longifolium* (VU) in full flower. Later in the year we travelled to Pondoland, a favourite destination, exploring the Majuleni area together with well-known conservationist, Sinegugu Zikulu. We also visited Lupatana on the Wild Coast, where Pondoland endemics are well represented.

Having ticked off most of our target species, those that remain are in inaccessible spots. A CREW helicopter is on our wish list! In the Umtamvuna Nature Reserve, there is ongoing monitoring of our threatened and endemic species, such as the Rare *Emplectanthus dalzellii*. We have found additional subpopulations of the *Hesperantha* species we discovered in 2018 and the good news is that it may have a name published this year. After a dry spring period, the good rains since November have produced a bounty of flowers, Orchidaceae in particular.

Joining the group of 'plant people' provided enjoyable opportunities to share knowledge as well as learn, not only from botanists, but also from experts in different disciplines. Who knew that snails could be so interesting...?

Figure 1: *Brachystelma gerrardii.*
Photographer: Graham Grieve.

Figure 2: *Indigofera* sp. nov. '*gogosa*'.
Photographer: Graham Grieve.

Figure 3: Measuring a transect of *Kniphofia drepanophylla* (EN) at Lupatana. Photographer: Graham Grieve.

Familiarity with plants enhances awareness of the unusual and finding an array of different coloured flowers amongst the usual orange *Watsonia pillansii* prompted detective work, leading to the conclusion that these are colour forms of *W. pillansii* rather than hybrids or new species.

The year started and ended with invitations to participate in Bioblitzes organised by the University of KwaZulu-Natal to assess the biodiversity at the Ntsikeni and Lebombo Mountain nature reserves. Joining the group of 'plant people' provided enjoyable opportunities to share knowledge as well as learn, not only from botanists, but also from experts in different disciplines. Who knew that snails could be so interesting...? The different geology of the Lebombo Mountain Nature Reserve offered a whole new suite of plants and although conditions were very dry, there were interesting trees in flower, members of the Capparaceae (Brassicaceae) family being particularly well represented.

Promoting awareness and conservation

We continue to promote awareness and conservation of indigenous flora wherever possible. Early in the year we gave a visiting overseas tour group a guided walk in the Umtamvuna Nature Reserve and it was good to see the appreciation of our flora from a group of people who have seen plants all over the world. We also hosted a well-attended outing of the Botanical Society KwaZulu-Natal Coastal Branch. The participants' enthusiastic response may lead to this being a regular event.

Ever on the lookout for new sites of the threatened coastal grassland biome, a survey of the grassland section of a farm in the Port Edward area produced a plant list that has encouraged the farmer's efforts to conserve the area. Unfortunately for one site gained, another was lost – a section of a farm that we have

Figure 4: Colour forms of *Watsonia pillansii*. Photographer: Graham Grieve.

Figure 5: The Rare *Schizochilus bulbinella* at Ntsikeni. Photographer: Graham Grieve.

been monitoring was lost to unauthorised agricultural transformation recently.

With the cooperation of a conservation-minded farmer in the Oribi flats area, we monitor two grasslands that are burned in alternate years, providing strong evidence for the beneficial effect of controlled burning for the production of flowers. One of the treasures from these grasslands is *Turraea pulchella* (VU) and the same farm is home to a population of *Aspalathus abbottii* (VU).

After several years of effort in capturing the data on the specimen vouchers in the Hugh Nicholson/Tony Abbott Herbarium housed in the Umtamvuna Nature Reserve, there was a final flurry of work doing quality control of these data and now the database has been completed and saved to the herbarium computer. Copies will be made available to Ezemvelo KZN Wildlife for further distribution as they see fit.

Reducing the threat of invasive alien plants

One of the important aspects of caring for wild flowers is reducing the threat posed by invasive alien species. As we are really privileged to be able to access parts of the Umtamvuna Nature Reserve that are not open to the general public, we happily 'give back' in the form of alien control where and when we see it is required. An observer would be surprised to see our vehicles suddenly pulling off the road next to the reserve for no apparent reason – the sight of pink pompom weeds (*Campuloclinium macrocephalum*) confirming that there is about to be a short 'alien hunt'. Heads are removed, bagged and taken away for destruction either by microwave or solarisation depending on quantity. Young plants are uprooted and more established plants are hacked back but noted for a follow up spray with the relevant herbicide. Areas of the reserve adjacent to farmland are also hotspots for invasive alien plants. Walking sticks in hand to test whether newly erected electric fences (to protect macadamia trees) are live,

Figure 6: *Maerua angolensis* at Lebombo. Photographer: Graham Grieve.

Figure 7: BotSoc outing at Umtamvuna Nature Reserve. Photographer: Tim McClurg.

Figure 8: *Turraea pulchella.* Photographer: Graham Grieve.

Figure 9: Eradicating invasive alien plants. Photographer: Tracy Taylor.

the CREW group removed several different smaller invasive alien plants, like *Chromolaena odorata*, and sprayed sizeable tracts of *Lantana camara* and *Acacia dealbata* which we also ring-barked. In addition, knowledge of the area provided valuable support to a student from Cape Town surveying the incidence of *Psidium* (guava) species and we assisted an intern at Vernon Crookes Nature Reserve to identify invasive alien plants for the development of an eradication plan.

To view the activities of Pondoland CREW and some of our special plants, visit http://pondoland-crew.blogspot.com.

Durban CREW group moving forward

By Bertha Pitout, Jocelyn Surtherland and Kaveesha Naicker

In the past few months, the Durban CREW group has undergone a few minor changes as Jocelyn Sutherland, the champion and driving force behind the group's success since 2014, moved further north, thus limiting her time to schedule activities with the group. This led to other members of the Durban group taking the reins to facilitate site surveys. It was different for the group to not have leading lady, Jocelyn, to organise and facilitate all CREW activities, but everyone managed to come together and work out a

The group has been able to provide a more accurate account of the species and conditions within these sites, whilst encouraging and supporting the staff who work on the sites with their expertise.

Figure 1: *Senecio natalicola.* Photographer: Graham Grieve.

Figure 2: *Oxygonum dregeanum.* Photographer: Bertha Pitout.

Figure 3: *Aloe minima.* Photographer: Gill Browne.

plan of action to conduct site visits for the field season under the guidance of Jocelyn.

The group also made .every effort to join outings of other CREW groups whenever time permitted. We also enjoyed frequent BotSoc activities, which have become precious to the Durban group. Earlier in the field season the Durban group visited Umtamvuna Nature Reserve as part of the BotSoc outings and got the opportunity to spend the day with the Pondoland group who were ever so welcoming to us. It was wonderful to be in a setting with such knowledgeable people and having the chance to see some of the reserve's most revered treasures. Kate and

Figure 4: Umtamvuna Nature Reserve.

Figure 5: Monteseel.

Graham Grieve facilitated the day's outing, which was scenic and memorable.

Through the group's regular visits to specific eThekwini sites and reserves, CREW is slowly building a long-term monitoring record for these sights. The group has been able to provide a more accurate account of the species and conditions within these sites, whilst encouraging and supporting the staff who work on the sites with their expertise.

During this field season, the Durban group managed to locate only five of the 16 targeted species. Although disappointed, we were not demoralised, and persisted with our CREW outings and confirmed new records for *Senecio natalicola*, *Cyphostemma flaviflorum*, *Oxygonum dregeanum*, *Streptocarpus molweniensis* subsp. *molweniensis* and *Dahlgrenodendron natalense*.

Since volunteers are mostly retired, the majority of our site visits are conducted during the week. That being said, on occasion we may also be somewhat digitally and memory challenged. So we are indeed indebted to the full-time CREW staff who help us

Figure 6: Two non-target plants that caught our attention.

Figure 7: *Raphionacme hirsuta* at Monteseel. Photographer: Bertha Pitout.

become familiar with the intricacies of linking CREW species lists on iNaturalist and learning to use the iNaturalist app. We are slow learners and need more input from the dynamic younger generation!

The beauty of it all is that the CREW programme feeds into SANBI's research and monitoring unit. That's the big picture that keeps us going.

The level of commitment and friendship amongst the members of the group is highly motivating; we share a strong bond while reinforcing and expanding our botanical knowledge. The last five years have been incredible having Jocelyn Sutherland champion the group in Durban. Her passion for conservation, creating awareness and dedication to the CREW programme has been inspiring to all. The Durban CREW group is grateful to Jocelyn for her service and we thank her for making every effort to join CREW outings now that she has moved.

Figure 8: *Senecio polyodon* var. *polyodon*. Photographer: Graham Grieve.

Journeying through Maputaland

Summarised from Maputaland botanising, January 2020 report by Francois du Randt

Dr Francois du Randt, author of *The Sand Forest of Maputaland*, and his wife Ronelle embarked on a 14-day expedition through Maputaland, braving the heat and humidity of January, in order to seek some of the region's finest botanical treasures.

This outing was arranged in three legs, the first of which began with the Du Randt's investigating the mangroves of Kosi Bay. Their visits to the mangroves have become a frequent event, with them refining their mangrove species lists on every trip, which had already included *Avicennia marina*, *Bruguiera gymnorrhiza*, *Rhizophora mucronata* and *Lumnitzera racemosa*. On this visit they aimed to search for two mangrove species, *Xylocarpus granatum* and *Ceriops tagal*, which are commonly used for their medicinal properties and as a source of firewood. They were joined by Ezemvelo KZN Wildlife official, Langa Gumede, who provided support on this outing, as they traveled by canoe along the Kosi Bay estuary.

Francois du Randt had obtained GPS coordinates for *Xylocarpus granatum* (the only known tree at Kosi Bay), from Scotty Robert Kyle, a former Ezemvelo KZN Wildlife official. He had previously visited the tree in 1999, so being able to revisit the site and observing the sturdy tree was wonderful. Their exploration efforts for *Ceriops tagal* were unsuccessful at Kosi Bay

Figure 1: *Lumnitzera racemosa* at Kosi Estuary. Photographer: Francois du Randt.

The group surveyed patches of sand forest, wooded grasslands and swamps en route to their campsite. They later investigated parts of the mangroves before visiting a lovely grassland with fragments of forests, where they observed Adenia gummifera *and* Albizia versicolor.

Figure 2: The group surveying the grassland of Tembe Elephant Park. Photographer: Francois du Randt.

estuary, however they did come across the species in the latter part of their expedition, whilst surveying the mangroves at the Maputo Special Reserve (MSR).

The second leg of their journey was joined by CREW, SANBI researchers as well as Kent University PhD student, Hermenegildo Matimele, and his team from Mozambique. The group had begun their trip in Jozini looking for *Thesium jeanae* (Rare) and *Kalanchoe longiflora* (VU), which they managed to find in the 44°C heat. The Du Randts linked with the group at Ndumo Game Reserve where they observed a large number of trees. The group, along with the assistance of Ezemvelo KZN Wildlife official, Catharine Hanekom, who was present to provide support against any wildlife attacks, surveyed the fragmented grasslands in the western region of the reserve searching for CREW target species, *Ceropegia cimiciodora* (VU) and *Hermannia micropetala* (VU), with no luck. Sadly, poor reserve management as well as the absence of black rhino and other browsers at Ndumo Game Reserve are the main cause of the severe bush encroachment within the reserve.

Figure 3: *Warneckea parvifolia* (CR) in Tembe Sand Forest. Photographer: Francois du Randt.

That afternoon, the group travelled to Tembe Elephant Park to search for *Warneckea parvifolia* (CR) and *Schlechterina mitostemmatoides* (VU). After a couple of hours in the sand forest, the group located the two species and were able to provide a more recent record of the populations growing within the reserve.

The next day the group continued on to Sodwana Bay to search for *Thesium polygaloides* (VU) and *Ceropegia arenaria* (EN). The Du Randts returned home with a plan to revisit Tembe Elephant Park later in the week with Hermenegildo Matimele and his team. This formed the third leg of the trip and they were joined by Linda Loffler of the Plant Specialist Group, and Ross Goode from Phinda Forest Lodge.

Once again at Tembe Elephant Park, the group were treated to an interesting commentary on the birdlife, grass species and trees observed at the park by Ross Goode, who kept the group entertained with his eccentric ways. The day was fruitful as the group

Figure 4: Our group under *Newtonia hildebrandtii* drainage line at Phinda. Photographer: Francois du Randt.

enhanced their grass, shrub and tree species lists. This was followed by visits to communal land around Bhekula Sand Forest Lodge and Phinda Forest Lodge, where the group explored the diverse vegetation within these areas. The Sand Forest portions of the communal land was filled with invasive species, Ross Goode suggested that a proper fire management regime was required to improve the health of the land. At Phinda, Ross provided insight into the unique geology and vegetation that could be observed, as the group ventured through the 140-year-old Bumbeni volcanic group adjacent to the lodge. After an eventful day and being rained upon, the group returned to their accommodation to reconvene.

The next day, the group investigated the False Bay section of iSimangaliso Wetland Park and part of the Mpophomeni Trail before heading up north to southern Mozambique. Francois joined the group after a quick survey of Sileza Nature Reserve before rejoining the rest of the group at Futi Entrance Gate of the MSR. According to Francois the MSR sand forest differs from South Africa's Maputaland sand forest, however, the overall characteristics remain the same.

The group surveyed patches of sand forest, wooded grasslands and swamps en route to their campsite. They later investigated parts of the mangroves

Figure 5: Linda Loffler by *Adenia gummifera*. Photographer: Francois du Randt.

before visiting a lovely grassland with fragments of forests, where they observed *Adenia gummifera* and *Albizia versicolor*. On the final day of the expedition, the group embarked on surveying the fascinating mountain slope near Goba Fronteira and the Umbeluzi Gorge, whilst enduring the extremely hot conditions. The epic botanical adventure concluded at Umbeluzi Bridge, where everyone said their farewells and headed home. It was an action-packed two weeks, with cherished memories being made.

Midlands CREW Memoire

By Alison Young

We managed eight official CREW outings over the past year, some of which we joined with the A-team.

In February 2019 we made a first attempt to search the seeps along the water courses at Highmoor Nature Reserve for the elusive *Huttonaea woodii* (VU). Herbert Starker joined us to help with the search and showed us examples of the little microhabitats to look out for. However, our search was not successful.

We were excited to have stumbled upon Felicia wrightii *(CR Rare) growing in the clear waters of a small open grassland stream near the summit. It was wonderful to record a new locality for this species.*

Later that same month we joined the A-team to Hlabeni Nature Reserve, near Creighton, which has a few remnants of good Mistbelt Grasslands. Our target species was the very beautiful *Erica psitacinna* (EN) which grows in the upwelling mist above the scarp forest. We were excited to have stumbled upon *Felicia wrightii* (CR Rare) growing in the clear waters of a small open grassland stream near the summit. It was wonderful to record a new locality for this species.

Figure 1: *Erica psitacinna*.

Figure 2: *Felicia wrightii*.

Figure 3: *Aloe saundersiae*.

Early in spring we joined the University of KwaZulu-Natal's three-day Entumeni Bioblitz. It was at a site where *Dierama pumilum* (VU) was historically known to occur. Though we were unsuccessful in finding our target species, we did make a substantial contribution to expanding the reserve's plant species list.

Next on our calendar was a revisit to Zinti Reserve on the Baynesfield Estate as our previous visit was almost a decade ago. The rains were late and the grasslands showed stress from several years of drought. The target species was again *Gerbera aurantiaca* (EN), which was historically recorded from the area, but we didn't find it. Disappointingly, there were various signs of grazing pressures within this biodiversity stewardship site.

In November we visited a newly established stewardship site, Triwirgie, near Baynesfield. These grasslands have a well-cared for population of *Gerbera aurantiaca* (EN). Since cattle were taken off the grassland, the gerberas have thrived. Our contribution to the KwaZulu-Natal Stewardship Programme is compiling a plant species list, but the area is large and this

Figure 4: *Crotalaria* sp.

task requires several field trips. There are a number of other stewardship sites that warrant our assistance for which we have already made landowner contact. We shall focus on these sites in the next field season.

Later in November, we went to Moor Park Nature Reserve in the Battlefields area of KwaZulu-Natal's highland thornveld to search for a minute aloe that truly earns its name, *Aloe inconspicua* (EN), and relook the *Calpurnia woodii* (VU) population that we last visited in March 2012. It was interesting to note that *Calpurnia woodii* was almost completely invisible at this time of the year. A species new to me was a beautiful, showy, fine-leaved *Crotalaria* sp. (see images). *Aloe inconspicua*, known to grown up to 200 mm tall, is easily camouflaged through its grass-like appearance and white-green inflorescences. Kevin Jolliffe observed a juvenile aloe that we all assumed to be our target, though without flowers this assumption could not be confirmed. Over the following weeks, we were 'living on a prayer', making repeat visits to the site in the hope that the aloe would be in flower, unfortunately with no luck. Nearly two months after our first visit, University of KwaZulu-Natal MSc student, Hannah Butler, reported that the aloe was in flower, with pale pink flowers. After some discussion, however, we confirmed, with much disappointment, that the plant which had deceived us for months was in fact *A. minima* – the previous record from this site was actually made with the plants not in flower.

Finally, in January 2020 we visited some old hunting grounds of Prof. Olive Hilliard at Little Noodsberg, a new site for us. The target species were *Dierama pumilum* (VU) and *Hesperantha gracilis* (VU) but we were too early for the latter. Nonetheless, our small group of attendees were excited that the group's maiden visit for the year yielded a healthy population of *Aloe saundersiae* (CR), a new locality for *Microtyloma coddii* (VU) and 20 orchid species – much to the dismay of the rest of the group who missed this trip. The remarkable conservation efforts on this working farm made for swathes of grassland and forest, a superb vantage point of Durban's iconic stadium to the south, and views of the magnificent Valley of a Thousand Hills to the east.

Thank you to all the volunteers for their good company and for contributing to a really successful WhatsApp group. Outings were well attended and the group's enthusiasm was infectious!

Underberg CREW groups adventured through the Berg

By Julie Braby

The previous flowering season was shortened due to late rains and other setbacks. So this flowering season was awaited with great expectations. However, the weather had other ideas as the first substantial rains only arrived in December. The result was that the early flowering plants just did not flower and many are later than usual.

Once through the forest we were met with a beautiful grassland filled with many orchid species. At the top of the mountain, after a steep climb, our target species, Erica psittacina, *was found in all its pink glory.*

Following on the very successful trip to Impendle Nature Reserve last season, a visit was made in November. The reserve was very dry and little was in flower. A few good photos were taken but no 'specials' were found.

We joined the Midlands and Durban CREW groups on a visit to Hlabeni Mountain near Creighton. Malcolm Gemmel kindly cut us a path through the bugweed and after leaving the plantation, we were met with a beautiful forest with many epiphytic orchids and forest specials including *Liparis bowkeri*, *Stenoglottis fimbriata* and *Habenaria malacophylla*. Once through the forest we were met with a beautiful grassland filled with many orchid species. At the top of the mountain, after a steep climb, our target species, *Erica psittacina*, was found in all its pink glory.

In late December a trip was undertaken to try and find the elusive *Trachyandra smalliana* as the area had been burnt during the winter. There was just nothing flowering, not even the common plants. Perhaps in February we would have better luck.

Our planning meeting held in early January has listed a number of high altitude specials found on the Sani Pass and surroundings. The plan was to look for them in late January but a few heavy rainstorms has made the pass almost impassable. These can only be looked for once the pass has been repaired which is currently underway.

We are very fortunate to have Garden Castle Nature Reserve on our doorstep and we have been known to find up to 26 orchid species in two days, so we have regular outings to this reserve. Our CREW volunteers were guides at the WOSA (Wild Orchids of South Africa) conference, which was held in late January near Garden Castle Nature Reserve. What a pleasure it was for us to showcase this beautiful area in KwaZulu-Natal.

A multi-day trip to Sehlabathebe and Tarn Cave was our most anticipated trip. Our group of ten set out in convoy to Lesotho via Ramatsiliso's Gate Border Post. Our first stop, on the road to St Bernard's Peak Hotel was impromptu but the beautiful display of *Gladiolus oppositiflorus* and *Gladiolus crassifolius* made the pause in the journey well worth it. In haste we moved on, but stopped again a little further down the road when we discovered a field of gorgeous pink *Nerine angustifolia*.

Figure 1: *Erica psittacina.* Photographer: Julie Braby.

Figure 2: *Habenaria malacophylla.* Photographer: Julie Braby.

Figure 3: *Disa oreophila* subsp. *erecta*. Photographer: Ansell Matcher.

We arrived at the lodge that afternoon after an easy drive with many more stops for flowers along the pass. The next morning, five of us hiked to Tarn Cave to hopefully find our target species, some last seen by Hilliard and Burtt. The weather was very good with a daytime high of 23 degrees and not a breath of wind experienced. The journey to Tarn Cave proved to be very floriferous and it was hard to walk past the many flowers. We made multiple flower pit stops and eventually made it to Tarn Cave by midday, finding two of our target species: *Disa oreophila* subsp. *erecta* and what we suspect might be *Isolepis pellocolea*, which is still to be confirmed by SANBI's herbarium. The wild flowers, rock paintings, fascinating sandstone rock formations and tarns within the park are so beautiful, we had a lovely time exploring on the way back to the lodge. This trip was very fruitful, with the group recording 30 orchid species and many other specials during the two days in the park. What a privilege it was to be in a place of such incredible beauty!

Our year so far has been filled with 'ifs and buts' and little to show for it, but we are optimistic that the new year will end on a high and we are looking forward to it.

Figure 4: *Isolepis pellocolea*. Photographer: Ansell Matcher.

The state of nature address

By Lerato Molekoa

Our country has many incredible landscapes that are aesthetically pleasing and naturally therapeutic. Traveling has been something that I have developed a desire for over the past few years and I have enjoyed all the places I had the opportunity to visit. I have never travelled to so many places in such a short space of time. From October to January I've travelled an estimated 2 325 km around KwaZulu-Natal alone, exploring, investigating, hiking and learning.

Relocating from a place known as the concrete jungle (also known as Johannesburg) to the Zulu Kingdom – home to one of South Africa's three biodiversity hotspots – has elevated my awareness of the sustainable development of environmental resources and the importance of conserving our indigenous biodiversity.

Early in January we travelled to the beautiful Sani Pass, a well-known feature in the Maloti-Drakensberg escarpment, with its unique steep and twisting gravel roads. The Drakensberg boasts unique flora that has adapted to its high-altitude environment.

Back-tracking to a few months earlier, we joined the Pondoland CREW group on an excursion to Ixopo and experienced a splendid show of different *Pachycarpus* and *Asclepias* species within a short distance of each other. We were chuffed to find one of the target species – the Critically Endangered *Pachycarpus acidostelma* – which almost immediately received a positive ID from our local expert, Adam Shuttleworth.

From October to January I've travelled an estimated 2 325 km around KwaZulu-Natal alone, exploring, investigating, hiking and learning.

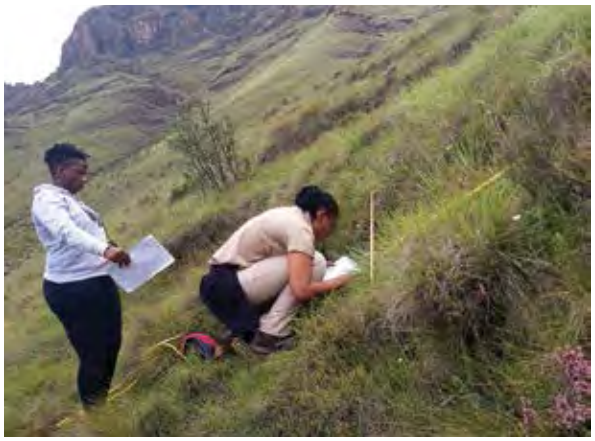

Figure 1: Hlengiwe and I conducting transect plots on Sani Pass. Photographer: Kaveesha Naicker.

Figure 2: *Pachycarpus acidostelma* (CR) with Pondoland CREW. Photographer: Lerato Molekoa.

Figure 3: The view of Sani Pass from Sani Pass Lodge. Photographer: Lerato Molekoa.

The CREW KZN team once again participated in the University of KwaZulu-Natal's community of best practice series of bioblitzes, aimed to bridge the gap between biodiversity researchers, students and members of the public. We visited three nature reserves in the Zululand region, Entumeni, Dlinza and Ubombo. The bioblitzes brought together a host of biodiversity specialists within KwaZulu-Natal which resulted in several interesting observations of plants, insects, reptiles, amphibians, molluscs and birds.

As my internship with the WWF environmental leaders programme draws to an end, I have been amazed by the work happening within the conservation sector in ensuring the sustainable development of our resources, protection of species and reducing the chance of species extinction in a South African and global context. We, as the millennials, need to be actively involved in environmental awareness as our existence depends on the ecological services that our biodiversity affords us.

'It's surely our responsibility to do everything within our power to create a planet that provides a home not just for us, but for all life on earth,' said Sir David Attenborough.

Wakkerstroom CREW news

By Jenny Maxted-Smith

The year 2019 was one of the driest years experienced in Wakkerstroom. In the past year, a lot of time has been taken up disputing the Volksrust Municipality's decision to lay a water pipeline from Martins Dam through the Wakkerstroom Wetland to Volksrust, without consulting environmental authorities or taking into consideration the impact this would have on the local biodiversity. These construction activities would endanger many of our species of conservation concern, including the Vulnerable *Nerine platypetala*. Fortunately, this action has been stopped in court for now.

These construction activities would endanger many of our species of conservation concern, including the Vulnerable Nerine platypetala.

Earlier in the year, we were invited to Madaka Game Farm in Vryheid, which shares borders with Ithala Nature Reserve. The CREW A-team joined us for a

Figure 1: The Vulnerable *Nerine platypetala*. Photographer: Jenny Maxted-Smith.

Figure 2: *Aptosimum lugardiae* at Madaka Game Farm. Photographer: Jenny Maxted-Smith.

weekend and a lot of specimens were collected. Here I collected *Aptosimum lugardiae*, which was identified at Buffelskloof Herbarium. This plant was not known this far south, which was quite interesting for me.

Kaveesha and Mkhipheni Ngwenya (From SANBI's KwaZulu-Natal Herbarium) joined us at Luiperdskloof Farm in the most dismal weather. We had better luck the next day and visited Gelykswater which used to be part of Luiperdskloof farm in the past. Their site has the most beautiful waterfall where we had a picnic lunch.

In November, Kaveesha and Aaliyah Motala (CREW intern) joined us in the search for *Afroligusticum wilmsianum* in Groenvlei, *Aloe hlangipies* and *Xerophyta vallispongolana*. We hope that the collected specimens come back with positive identifications.

While we were in the Eastern Cape, we visited the Honeyville Nature Reserve and Eco Village just outside the Humansdorp area. You can imagine our delight when we were asked, if we had heard about CREW. Mrs Logie and the Eastern Cape CREWites were doing another survey that weekend. They were practising permaculture and restoring a vlei on the estate, totally off grid. Unfortunately, we weren't able to join in, but it made me happy to no end!

We also visited the Van Stadens Nature Reserve, which some years ago we were told, was run down and not safe to go to. Well, it is beautiful. The Friends

Figure 3: Waterfall at Gelykswater. Photographer: Jenny Maxted-Smith.

of Van Stadens group have worked extremely hard and as Port Elizabeth expands rapidly, it will soon be in the heart of the city. My youngest grandson, who is a keen birder, spotted his first Cape Sugarbird resting on the proteas. We will visit again when we are down in the Eastern Cape and hope to catch them on a day when the indigenous plants are on sale to the public.

The drought has seriously limited the amount of flowering plants seen in the area. We look forward to a wetter year filled with gorgeous wild flowers.

Figure 4: Kaveesha and Aaliyah in the Groenvlei. Photographer: Jenny Maxted-Smith.

Figure 5: Permaculture tunnels at the Eco Village. Photographer: Jenny Maxted-Smith.

Limpopo CREW's field season

By Bronwyn Egan

Limpopo Province continues to be ravaged by a seemingly unending drought. Rainfall on the escarpment, breached by magical Magoebaskloof and renowned as a mist collector, can no longer keep up with the demand on the streams feeding into Tzaneen and Ebenezer dams. These have become mere puddles and pools, a sight that raises eyebrows but no action, and as the water disappears, so the dust around the dams rises.

It is easy to become disillusioned and depressed by the crackling veld and a lack of vision and leadership in protecting our vital natural resources. CREW in Limpopo seemed to mirror this distress and our

Our late rains, albeit meagre, have also raised our spirits and we are pleased to report on some interesting fieldwork and projects over the last few months.

Figure 1: *Brachystelma gerrardii* found in the Wolkberg. Photographer: Bronwyn Egan.

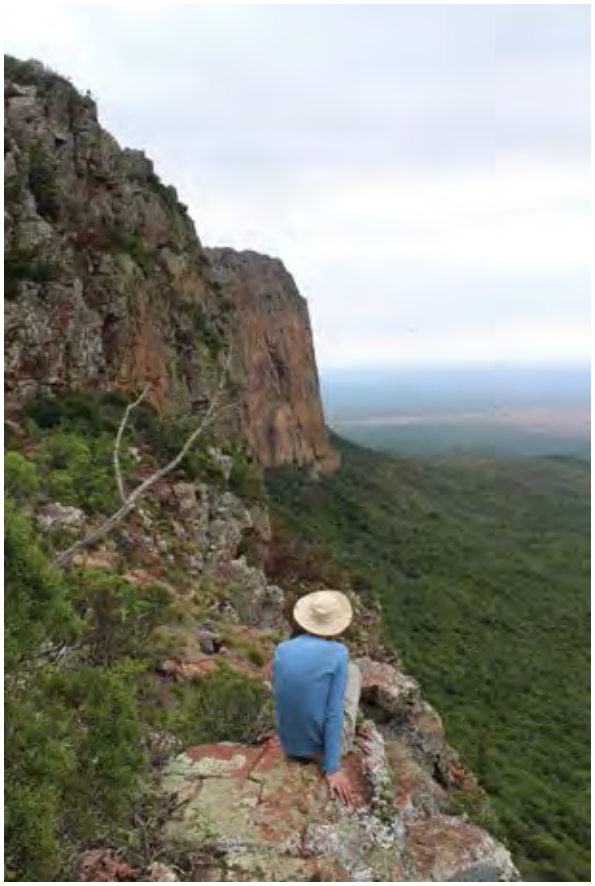

Figure 2: Ray Kroger contemplating the cliffs at Blouberg where *Dioscorea sylvatica* and *Bowiea volubilis* subsp. *volubilis* occur. Photographer: Bronwyn Egan.

Figure 3: *Satyrium longicauda* forming fields of flowers below Pypkop. Photographer: Bronwyn Egan.

active group shrunk alarmingly. However, after a hiatus of apathy, Limpopo CREW is resurrecting itself in 2020. Our late rains, albeit meagre, have also raised our spirits and we are pleased to report on some interesting fieldwork and projects over the last few months.

Willem van der Merwe and Lufuno Kunanani led a small group to precious wild patches in the Polokwane suburbs in late January. Their checklist has not been finalised, however, they did record a more robust form of the rare *Euphorbia groenewaldii*. This might be due to denser shade, since the grass in this area is not subjected to the same amount of grazing that occurs at Ga-Mothiba (its type locality), or perhaps it represents a taxon on a species continuum between *E. groenewaldii* and the more common *E. tortirama*. This is a mystery awaiting resolution, in the meantime we collect and note localities and threats to this interesting form. Willem, an expert at finding hidden treasures, spotted a thriving population of *Ledebouria crispa* amongst the fresh grass. We were excited to learn that a species that Ernst van Jaarsveld described in 2005 (see the publication *Aloe* 42: 1 & 2) has a number of small populations growing close to the biggest shopping mall in Limpopo. Willem has often spoken of the obscure *Kleinia venteri*, a small succulent, known only from rare patches of natural vegetation remaining in Polokwane. Fortunately, its stoloniferous habit allows it to persist, despite frequent mowing of road verges. There are plans to investigate the taxonomy and conservation status of this fascinating special, hopefully in time to protect it from urban development.

A quick walk up Wolkberg enabled Willem to find *Brachystelma gerrardii*, a rare and seldom seen species, growing at the base of the cliffs. The Wolkberg also yielded *Drimia sanguinensis* which Lufuno managed to collect fruit from for the Millennium Bank Seed Collection.

The Blouberg hike in early December 2019 boasted four days of solid rain. We spent most of the time walking with heads obscured by waterproof hoods. We observed a healthy population of *Bowiea volubilis* subsp. *volubilis* creeping out of their dry season hidey holes on a slope amongst *Senegalia ataxacatha*. The identity of the fresh new tendrils were a mystery at first, as they had not developed their secondary net-like growth. This same slope yielded a population *Dioscorea sylvatica* and the beautiful *Tylophora coddii* with their twisted star flowers. *Tylophora coddii*, although common in its distribution, is endemic to the Blouberg and Soutpansberg ranges and, therefore, always special to see.

Figure 4: Searching for vernacular plant names and specimens in the mountains around Boynes. Photographer: Bronwyn Egan.

One of the reasons why field trips took a back seat during this field season, was the development of our botanical garden at the University of Limpopo (UL). It is primarily used for hands-on activities with learners, however, recently it has become popular amongst people interested in medicinal and threatened plants. From our interactions with visitors, we are able to learn about new localities and new plant uses. The Larry Leach Herbarium (UL) is currently conducting the Vernacular Name Plant Project in order to generate a database of plants within Limpopo Province, linking herbarium specimens to relevant vernacular names. We are also archiving a backlog of specimens from a plant use project that was conducted more than 50 years ago, which is yielding a multitude of names and specimens with excellent locality information. These will be added to the CREW database in batches of fifty as they are archived.

Working with dry plant specimens is acceptable and even fun if these are herbarium vouchers. Working with dry plants in the field, however, is decidedly disappointing. Our Bakone Malapa (Polokwane) field trip, which was the first of the season in October 2019, yielded mere tantalising glimpses of young leaves and immature flower buds. The trip was, however, successful in terms of the human gems that we unearthed. A collaboration between Friends of the Polokwane Nature Reserve and CREW Limpopo, meant that we met people from as far

Figure 5: *Tylophora coddii* an endemic to Blouberg and Soutpansberg. Photographer: Bronwyn Egan.

afield as Mpumalanga, as well as those on our doorstep, all of whom are interested in collaborating with us on documenting our threatened flora.

On 5 February, our trip to Pypkop in the Woodbush yielded fields of flowering *Satyrium longicauda*. *Disa patula* and *Disa versicolor* were observed between the satyriums and one or two *Habenaria filicornis* plants were also seen. At our last stop a small population of *Eulophia parvilabris* were flowering amongst the tall grasses of a hillslope, making it five orchid species in one morning. Our beautiful sighting of a bushbuck mother with her doe was the perfect ending to a stunning outing.

CREW Limpopo is down but certainly not out and every now and then we unexpectedly surprise ourselves with a treasure both in human and plant terms.

Polokwane endemics

By Willem van der Merwe

The Polokwane Plateau is a distinctively vegetated region, much threatened by development. Four species of plants, especially, are at risk. These species occur, as far as we know, only here.

Kleinia venteri was named a couple of decades ago by Ernst van Jaarsveld. He first noticed these tiny plants around Polokwane. The species is very humble, the aboveground stems are rarely longer than 50 mm and the small, succulent leaves are about 25 mm in length. Underground they have a little tuber that survives the harsh, dry winters, sending up new leaves and stems every spring. Flowers grow from the tip of the leafless stem at the end of winter, only slightly smaller than the entire rest of the plant! Flowers are cream-coloured, with greenish stamens protruding from tubular disk florets.

For conservation purposes, the main goal would be to determine how widespread it is and how many of them there are. At the moment things are not looking good. The few patches where I've found it growing have no protection: people walk there, dumping rubbish, and in two places the municipality annually mows the grass with big trucks, often crushing the small kleinias under their wheels. The patches where they're less disturbed, are experiencing ecological alterations in the form of bush encroachment. Furthermore, the veld is not burnt regularly, allowing more trees and shrubs to grow and shade out the little kleinias. Without serious help, the species could soon disappear from the wild. We have at least a few plants in cultivation, and they are quite easy to propagate.

Our next species is *Ledebouria crispa* (EN). *Ledebouria* is a genus of bulbs in the hyacinth family, including perhaps over 50 species, most of them found in northeastern South Africa. Polokwane features numerous species growing close to among each other. They're often found in grassland and especially on

Figure 1: *Kleinia venteri.*

Figure 2: *Ledebouria crispa.*

Figure 3: *Euphorbia clivicola*.

rocky hills. *Ledebouria crispa* is one of the smaller species, in the veld rarely growing over 50 mm tall. It can be recognised by the crinkly edges of its unmarked, narrow leaves. Its flowers and fresh fruit capsules are pinkish-purple. This species grows mainly in long crevices in rocks. There is often only a shallow layer of soil in these crevices and sometimes the tops of the bulbs protrude from it. The species is social with each crevice hosting many individuals. They propagate from seeds and also from adult plants budding into new bulbs at their bases.

While there are thousands of plants in the population that I know of, they are only known from a single, small area. This locality is close to shopping centres, surrounded by roads and residential areas with plans for further developments in future which would destroy more of its habitat. I hope to find other populations of the species, but for now, it is critically dependent on this small patch, which should be protected and remain undeveloped.

The very same patch of land also hosts *Euphorbia groenewaldii* (CR). This spiny succulent also grows in crevices between rocks, but is somewhat more adaptable than the ledebourias, in that they often also grow in flat, open land. It is recognised by its corkscrew-twisted stems. Another species, *Euphorbia tortirama*, is very similar, and part of the work we need to do is to resolve just how it is related and distinguished from that species. It may turn out to be the same species, which in a way would be good, since it would mean that it is more widespread and less rare than we think. I know of a few populations in our region and they differ in certain respects. It would be a good idea to try to preserve all of the populations. The threat, as everywhere, is in their habitat is being developed into residential areas.

So these are our four special, endemic Polokwane plants and it is likely that there are more endemics waiting to be discovered.

Figure 4: *Euphorbia groenewaldii*.

Our last special plant is *Euphorbia clivicola* (CR). Although related to *E. groenewaldii*, it looks very different. Its stems are finger-like, not conspicuously angled or twisted, and not as thorny. The species can grow into large, cushion-like mounds measuring a metre in width, with hundreds of stems pressed tightly together. This species occurs just across a road from *E. groenewaldii*, amazing that on one side of that road you only find *E. clivicola* and on the other side of the road only *E. groenewaldii*.

In the eighties, there were more than 3 000 individuals of this species in eastern Polokwane. The land where it occurs was then methodically turned into residential areas and shopping centres. Now, only a small piece of veld around some reservoirs remains, and even that is shrinking as more people build their houses there. Many people dump their rubbish in the veld, some even throwing it right on top of the *Euphorbia clivicola* plants. The rubbish attracts rats that gnaw and damage the plants as well. We still managed to find over 200 plants recently, but that's not a very robust population. Furthermore, the veld is changing and becoming more crowded by trees and shrubs, the typical pattern of bush encroachment affecting much of northern South Africa.

So these are our four special, endemic Polokwane plants and it is likely that there are more endemics waiting to be discovered. We don't know much, scientifically speaking, about any of them, as we still have to sort out their relationships, determine their distributions, ecological roles and growing/flourishing requirements. None of them receive any official protection – none of them are known to occur in the Polokwane Nature Reserve, the only substantial protected piece of land that we have. All four species are under pressure from ever-expanding residential areas and other developments. Their situation is typical of that of many, many species of plants all over the world. It's a race against the clock to catalogue them and to try and save them before they're gone forever.

Figure 5: Looking at *Cyphostemma oleraceum*.

My perspective on citizen science

By Aaliyah Motala

Figure 1: Pondoland CREW group photographing plant species at Jolivet. Photographer: Aaliyah Motala.

Working with the CREW programme has ushered in a new term into my common vocabulary – citizen science; which has been brought up many times within the CREW programme. What does the term actually mean?

Citizen scientists are defined as people who practice public participation to carry out scientific research, which can be conducted, in whole or in part, by amateur scientists or citizens. Amateur scientists participate in projects to increase their scientific understanding, learn about environmental issues, or to just enjoy nature.

I've learnt a lot from being surrounded by the CREW citizen scientists. I was awestruck to find that people with unrelated jobs would take leave from work to join CREW's botanical field trips! My internship activity (and strength) is focussed more on preparing for field trips than conducting fieldwork. However, during the few field trips that I attended, it was refreshing to see the enthusiasm and knowledge of the many citizen scientists.

Figure 2: CREW KwaZulu-Natal interns capturing data during a field trip in 2014. Photographer: Suvarna Parbhoo-Mohan.

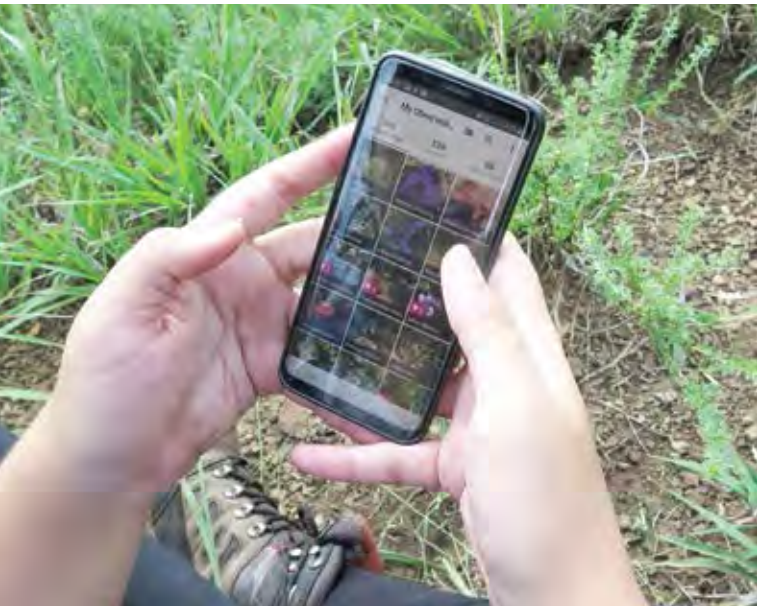

Figure 3: CREW KwaZulu-Natal intern capturing data directly into the CREW project on the iNaturalist app in 2020. Photographer: Lerato Molekoa.

Reading through the various CREW newsletters, the first of which appeared in 2005 (when I was still in primary school), to last year's edition, I grasped how far citizen science has progressed through the CREW programme.

We live in a world that is becoming progressively more connected and digital. In the past 10 years or so, fast developments in digital technologies, such as the cloud, internet, wireless networks and, most importantly, mobile communication technology, have dramatically changed the way we work, live, play and even think.

This can be seen over the years where citizen scientists first took to iSpot and now iNaturalist to share their observations. The ever-growing community of citizen scientists on iNaturalist contribute immensely (and sometimes unknowingly) to South Africa's flora and fauna data. This online biodiversity platform has blurred the professional and amateur boundary, while changing the public's outlook on engagement with science and nature.

I have observed interaction on iNaturalist where users identify and comment on the many observations uploaded. This active learning goes beyond the user that uploaded the observation, as other users also learn from the comments. Similarly, having conducted an iNaturalist activity at an eco-school, I was glad to see a learner enthralled by this 'new world' as she quickly downloaded the mobile app.

Citizen scientists are more than volunteers; they use their personal time to do something that they are passionate about and thereby contribute a massive amount of data to the broader scientific community.

Citizen scientists are more than volunteers; they use their personal time to do something that they are passionate about and thereby contribute a massive amount of data to the broader scientific community. I was astonished to learn that the CREW citizen scientists have, since 2003, donated time equivalent to 98 person years to plant conservation.

My interest in technology and apps has provided the opportunity for me to coordinate the Durban City Nature Challenge whereby I'm quickly learning about the variety of citizen science networks within KwaZulu-Natal. Despite the limited time and the challenge happening at the end of our peak biodiversity season, I'm looking forward to building new partnerships that will hopefully also expand the CREW network within the eThekwini Municipality.

Figure 4: Gill Brown (Durban CREW) taking images for iNaturalist. Photographer: Kaveesha Naicker.

MSBP and CREW working together towards the same goal: plant conservation

By Sibahle Gumede, Naomi Mdayi and Victoria Wilman

Over the years, the Millennium Seed Bank Partnership (MSBP) and CREW programmes have collaborated and worked together in many plant conservation activities and, although these are two different programmes, the overall goal of both is ultimately to conserve and safeguard the flora of South Africa.

The MSBP's work is focused on ex situ conservation, i.e. collecting, storing and safeguarding living collections of seeds, so that if the plants are lost completely, and become extinct in the wild, we are able to restore them, ensuring that they are not completely gone forever. We have been doing this work for the past 19 years, in partnership with the Royal Botanical Gardens, Kew, and so far 7 014 South African collections and 4 509 individual plant species have been successfully banked, 734 (523 species) of these are threatened. We are also working together with the Threatened Species Programme (TSP) to achieve target 8 of the South African (and Global) Strategy for Plant Conservation, where South Africa has committed to having 60% of our threatened species in ex situ collections and 2% in active restoration programmes.

The work of CREW is essential to the work of the MSBP, providing information on populations, Red List status updates and alerting us to those species most critically in need of attention. Targeting and finding species in the field is one of the challenges faced by seed collectors: discovering what to collect, where and when.

The work of CREW is essential to the work of the MSBP, providing information on populations, Red List status updates and alerting us to those species most critically in need of attention. Targeting and finding

Figure 1: MSBP seed conservation training with Swartland CREW.

Figure 2: A, Outramps Crew group collecting seeds during the MSBP seed conservation training field day; B, Outramps CREW group pressing specimens during MSBP seed conservation training; C, Sibahle Gumede doing a presentation on MSBP during the CREW summer rainfall workshop; D, Vathiswa Zikishe collecting seeds for MSBP; E & F, Volunteers at Fernkloof Nature Reserve looking at flowers and seeds close up.

species in the field is one of the challenges faced by seed collectors: discovering what to collect, where and when. CREW has helped tremendously by providing accurate and recent locality information and updates on the state of the seeds. The CREW work in the field, searching and locating plants during flowering season, is the first step in many cases, after which, MSBP seed collectors return to target and collect seeds. With this in mind, many collaborative field trips have taken place which have resulted in a number of species of conservation concern being banked with the MSBP, including *Eriospermum bractearum* (VU), which is not only threatened by habitat loss and degradation in the Eastern Cape, but is also harvested in large numbers; *Orthopterum coegana* (CR), with only one unthreatened population surviving; *Spatalla ericoides* (EN), with only 2 500 individuals existing within a couple of populations collected on the Agulhus Plain during a joint trip with the Cape Peninsula CREW group.

Figure 3: *Cyclopia pubescens* (CR) seeds collected in collaborated trip between NSBP and CREW.

The relationship between the CREW and MSBP programmes does not only involve doing field trips together, but we have also become each other's eyes, and hands in the field. Vathiswa Zikishe, CREW's Eastern Cape coordinator, recently donated seeds of Critically Endangered, *Searsia albomarginata* to the seed bank. Although MSBP seed collectors could not attend the search for this special plant, this did not stop CREW from successfully making this seed collection and a number of others such as *Aloe bowiea* which is Critically Endangered and declining rapidly.

Some CREW volunteers who wanted to contribute even more, have attended MSBP seed conservation training courses, and have over-exceeded our expectations by submitting a great number of collections, consisting of seeds, data and herbarium vouchers to be banked. The MSBP team is hugely grateful to the Outramps, West Coast, Cape Peninsula, CREW EC teams and others for their many wonderful collections and assistance. In the Western Cape, we recently held a training course with CREW volunteers from Swartland CREW in Riebeek Kasteel, followed by a very successful collaborative field trip resulting in many collections for the seed bank. In the east, a collaborative workshop was held in October 2019 and was attended by existing CREW volunteers, new potential volunteers and students from Rhodes and Fort Hare Universities. This was followed by some hands-on seed collection training in the field and has hopefully inspired some new seed collectors to join the effort to get as many of our critical threatened species secured. It is these relationships and the help of the volunteers that keep MSBP South Africa and CREW on top of the game, and in 2020 we look forward to achieving even more together.

The MSBP work in all provinces, and although our teams are based in Pretoria, Kwelera, Thohoyandou and Kirstenbosch national botanical gardens, it is not always possible to get everywhere at once to collect everything that we need to ensure a future for our flora. Our partnership with CREW has helped us to achieve more than we would have on our own, and we would like to thank each and every one who has assisted us in any way.

We continue to invite CREW volunteers to assist either by taking part in training courses and collecting seeds, alerting us of new species you have seen in flower or seed, joining us on field trips, or sharing localities and other information with us.

For any contributions and queries please contact Victoria Wilman (MSBP Manager) on v.wilman@sanbi.org.za.

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MILLENNIUM SEED BANK PROJECT Kew

An idea for citizen ex situ conservation – extending the CREW model to GREW™

By Dr Donovan Kirkwood (Curator, Stellenbosch University Botanical Garden)

Our rich South African flora represents an immense conservation challenge, with a substantial proportion of plant species only occurring in one small area or being naturally rare. The 2018 National Biodiversity Assessment showed that our most threatened ecosystems are still experiencing ongoing habitat loss faster than less threatened ecosystems. Compound this with climate change, which is pushing temperature and rainfall regimes beyond what many plants can withstand, and the accumulating effects of historical landscape fragmentation and degradation, and we are staring an extinction crisis in the face. A quick check of older Red List data I have on hand suggests that at least 1 500 plant species are at substantial risk of extinction (EN, CC, CR PE), and we know that many of the nearly 3 000 Vulnerable and Rare South African species are also at very real risk of extinction in the event of any further decline. Proper habitat conservation is still the only sustainable long-term approach to retaining landscape biodiversity. But we are also at a point where the global population of many species is reduced to a handful of individuals. In these cases, holding and building collections in cultivation is the only way to prevent outright extinctions in the short term.

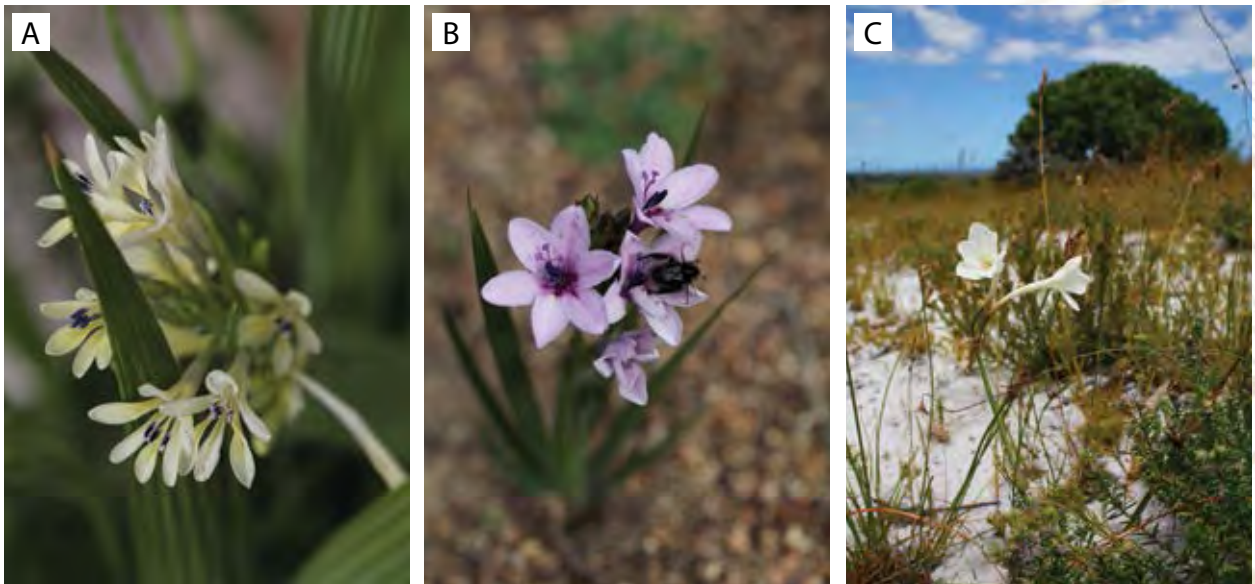
Proper habitat conservation is still the only sustainable long-term approach to retaining landscape biodiversity. But we are also at a point where the global population of many species is reduced to a handful of individuals.

CREW has clearly demonstrated the huge potential of a coordinated group of dedicated volunteers to achieve globally outstanding national Red List monitoring results, while also enabling local involvement and protection of key sites. More or less around the same time a couple of years ago, Ismail Ebrahim and myself started thinking of a similar approach to dealing with the ex situ challenge. What about a GREW™ (Growing Rare and Endangered Wildflowers) as part of the CREW custodians model?

Botanical gardens have been the traditional centres for keeping threatened species in cultivation – i.e. ex situ conservation. There are many good reasons for this – botanical gardens have:

- The correct national and provincial permits and credibility to collect and hold material in a way that does not facilitate poaching.
- Accepted best practise for collection management that includes:
  - Collections should be properly managed in terms of data and labelling via a specialist plant management database.
  - Sensitive and important data essential for restoration grade material, especially exact locality, is held securely and confidentially which is

Figure 1: A, *Babiana odorata*; B, *Babiana purpurea*; C, *Cyrtanthus leucanthus*.



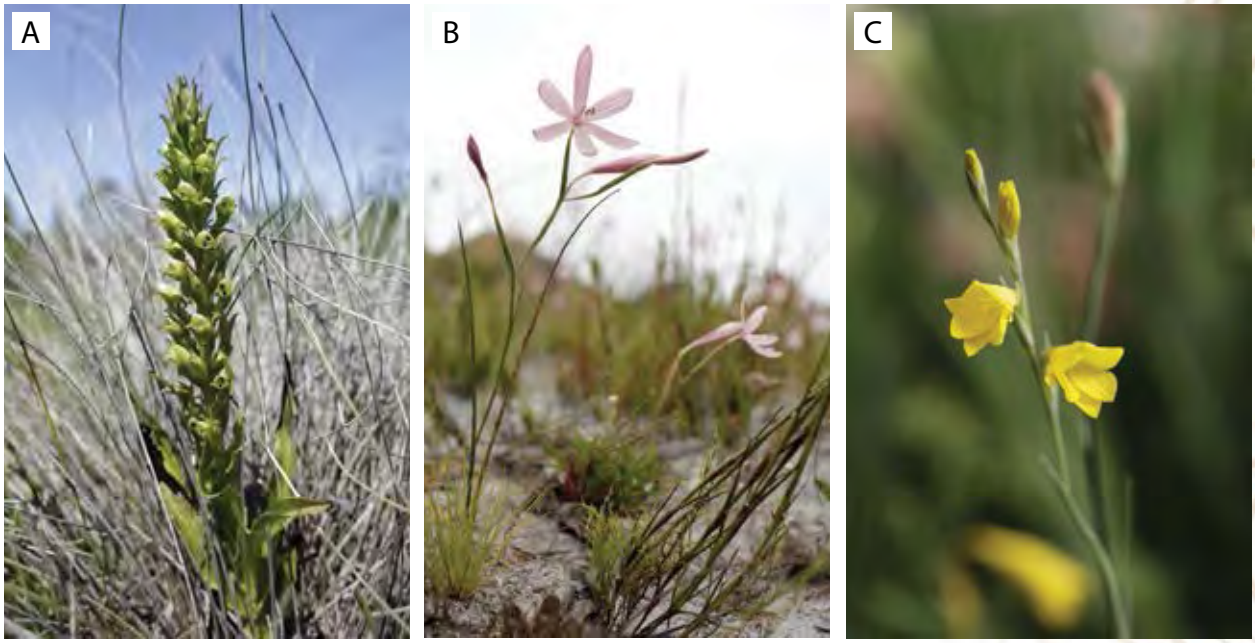


Figure 2: A, *Disa halackii*; B, *Geissorhiza bonaspei*; C, *Gladiolus aureus*.

especially important for the many species vulnerable to poaching.
  - Collection populations should be managed to maintain genetic diversity and integrity, to avoid inbreeding, but also any risk of unintended cross pollination and unwanted hybridisation of material by related species.
- Teams of specialist horticultural and botanical expertise, and knowledge and facilities to grow challenging species with unique requirements.

But there is a key thing even all the SANBI and academic botanical gardens together don't have – capacity to hold, care for, and bulk up the thousands of plant species that have declined in the wild to the point that they would benefit from ex situ backup during the last two decades. Botanical garden collections are also dependent on continuity of care and management by a small pool of expert curators, and species are generally held in only one or, at most, two formal collections, with all the risk that this implies.

Figure 3: A, *Gladiolus teretifolius*; B, *Moraea tulbaghii*; C, *Tritoniopsis elongata*.

Figure 4: A, *Haemanthus pumilio* (EN) from extinct population; B, *Romulea aquatica* (EN) seed for conservation growing.

So what are the potential benefits of having private citizens grow threatened species as proper ex situ conservation collections? To name a few, the following:

- Capacity. There is an existing extensive network of passionate, knowledgeable and experienced hobby growers who value species with provenance and importance, and would be willing to provide their time for free. This includes overseas networks, like the Pacific Bulb Society who has an incredible expert knowledge base and has expressed interest in the idea.
- Spreading of risk. Ability to hold sub-collections of important material at multiple locations.
- Ability to hold small collections at each location, reducing risk of material mix-ups or unwanted hybridisation.
- Having much of the growing being close to natural locations, or in similar climatic zones, so that growing can be achieved with minimal infrastructure and resources, just space and time.
- Engaging even more people with personal and meaningful relationships with the plants and their habitats, and teaching collectors more about conservation context and value. Turning potential supporters of illicit plants into defenders of conservation.
- Providing material that can be used for reintroductions of these highly threatened species back into the wild.
- Availability of legitimately sourced material via a permit holding institution may even reduce poaching.

So wouldn't it make sense to combine the institutional benefits, expertise and knowledge management capacity of botanical gardens with the resources of private growers? Importantly, GREW™ wouldn't need to be an additional burden on existing CREW volunteers who may be more interested in fieldwork. It would make sense to recruit those with a specific interest in growing. This model is likely to work better for some groups that already appeal to specialist collectors such as bulbs and succulents. There would have to be rules and conditions to participation, regular reporting and auditing, some careful thinking around management and mitigation of new risks, and pilot projects to find and iron out problems.

We think the concept has merit, and over the next year, the SANBI Threatened Species Unit, Gardens Conservation Unit, the Botanical Society Conservation Programme and Stellenbosch University Botanical Garden will work together to develop this idea and move towards a pilot phase. Please do let us know if you are interested to volunteer so we can map out which groups we can pilot this new approach with.

Figure 5: *Oxalis fragilis* (CR), Port Elizabeth, possible last wild population.

Help monitor our rivers and wetlands as a citizen scientist

By Namhla Mbona

South Africa has many wetlands covering 2.2% of the country's surface area, across multiple land ownerships. Our rivers and wetlands are home to an abundance of animals and plants that we need your help to survey, monitor and protect as a citizen scientist. The services freshwater ecosystems provide are diverse and require different strategies for conservation and wise use. Conservation and wise-use strategies require data collected throughout the year to enable informed decision-making, in order to ensure that while wetlands benefit people, their ecological integrity is maintained. Government has limited resources to collect the data and inform conservation strategies, thus citizen science can play a major role in our efforts.

By taking part in freshwater citizen science projects, your work will help to protect our rivers and wetlands for future generations. Using your snaps, we can build a community-contributed database to provide new insights on rivers and wetlands and their response to a changing climate and high demand on ecosystem services. Over time, your photos will record erosion and recovery cycles and other long-term changes, helping us understand why some ecosystems are more dynamic or resilient than others. Your photos will help to improve the way local communities and government manage our valuable freshwater environments.

The SANBI Freshwater Biodiversity Unit is initiating a number of projects to collate freshwater species data on iNaturalist.

A new collection project has recently been set up on iNaturalist

The collection is based on a preliminary list of obligate wetland plants of South Africa. It also reflects South African Red List status.

Obligate wetland plants are almost always found in wetland (>99% of the time). Accompanying habitat photos and observational notes would be welcomed through project member observations, to help us understand the range of habitat wetness conditions each species may tolerate, e.g. dry, seasonally saturated soil, or inundated (surface water) at the time of observation. The project is in the early stages and further questions will be added over time, e.g. sand, clay or peaty soil; observed threats; etc. We hope to soon start to be more active in posting news and hosting discussions. Please join us!

The project was set up through a collaboration of SANBI's Freshwater Biodiversity Unit, Threatened

Conservation and wise-use strategies require data collected throughout the year to enable informed decision-making, in order to ensure that while wetlands benefit people, their ecological integrity is maintained.

Figure 1: The correct way to observe wetland plants #protectourwetlands. Photographer: Suvarna Parbhoo-Mohan.

Species Programme and CREW. The initial goal of the project is to promote increased observation of wetland plants and develop a community of observers.

The project also hopes to assist in promoting Red List evaluations. Very few wetland plants have been subjected to evaluation in South Africa. Anyone may contribute, through first identifying a plant from the collection site: https://www.inaturalist.org/projects/freshwater-biodiversity-of-south-africa-wetland-plants.

The next step is to join the Rapid Red List Data Project (https://www.inaturalist.org/projects/redlist-s-afr) and filling out the fields:

a. population size & extent: how many seen or estimated and what area encompassed by the population; and
b. population threats: those visible or present influences that might threaten the existence of this population.

Alternatively, the conventional CREW species sheet can be filled in, using the species sheet (https://www.inaturalist.org/projects/crew-species-sheet-s-afr) and site sheet (https://www.inaturalist.org/projects/crew-site-sheet-s-afr).

Contact Hlengiwe Mtshali (H.Mtshali@sanbi.org.za) or Nancy Job (n.job@sanbi.org.za) for more information.

Water monitoring City of Tshwane

Discover the aquatic plants and animals of freshwater ecosystems in Tshwane. Please contribute observations for species found in wetlands and rivers within this designated project area.

Contact Namhla Mbona (N.Mbona@sanbi.org.za) for more information.

TUT wetland monitoring

This is a multidisciplinary research programme adapted for the students of Tshwane University of Technology (TUT). It is a partnership and collaboration between TUT Green Arcadia (TGA) and SANBI. It includes various additional stakeholders in the capacity of partners or sponsors. This project aims to collect data at selected sites along the Apies River, a

Figure 2: Water monitoring in Tshwane with the local school. Photographer: Namhla Mbona.

wetland in Tshwane, and artificial ponds at the Pretoria West TUT campus. The project aims to:

- conduct a multidisciplinary water monitoring research project;
- provide skills development and training for TUT students (members of TGA) within the program;
- offer a research-based report on water health on the selected sites;
- develop new research approaches (including citizen science), projects and recommendations for water conservation within these sites; and
- create environmental awareness, education and conservation amongst the students and community.

Contact Namhla Mbona (N.Mbona@sanbi.org.za) for more information.

We are also initiating partnerships with other organisations. Work with us! Whatever your interests or expertise, please join and contribute to the freshwater biodiversity information for your area. Watch this space as our emerging list of freshwater citizen science projects starts to grow.

South Africa's National Biodiversity Assessment: the status of ecosystems and biodiversity

South Africa's significant biodiversity

It is not every country that develops and makes use of a primary tool to inform policies, strategies and activities to manage and conserve its biodiversity more effectively. One such tool, known as the National Biodiversity Assessment (NBA) was released on 3 October 2019 by Minister of Environment, Forestry and Fisheries, Ms Barbara Creecy. The NBA serves as a detailed assessment of the state of ecosystems and biodiversity in South Africa, and is led by the South African National Biodiversity Institute (SANBI). It is a valuable tool for the government, civil society and the scientific community to inform policy, planning and decision-making on the wise use of the country's biodiversity assets and the management and restoration of ecological infrastructure.

Figure 1: Form left to right: SANBI Acting CEO, Ms Carmel Mbizvo; Minister of Environment, Forestry and Fisheries, Ms Barbara Creecy; SANBI Board Chair, Ms Beryl Ferguson, National Biodiversity Assessment lead, Dr Andrew Skowno. Photograph supplied: SANBI.

Findings of the National Biodiversity Assessment

The findings revealed that almost half of all South Africa's 1 021 ecosystem types are threatened with ecological collapse, and one in seven of the 23 312 indigenous species that were assessed are considered threatened with extinction. All of South Africa's 20 401 plant species have been assessed and 14% are threatened with extinction. The most concerning of the report's findings relate to South Africa's freshwater ecosystems, rivers, wetlands, estuaries and freshwater fish stocks.

Plants and freshwater fishes also have the highest proportion of species that are classified as Not Protected. Freshwater fishes are the most threatened species group assessed in South Africa – which is a reflection of the generally poor ecological condition of many of our rivers. When considering threatened species alone, more than 85% of threatened birds, plants, freshwater fishes, amphibians, mammals and butterflies are under-protected.

All of South Africa's 20 401 plant species have been assessed and 14% are threatened with extinction.

Figure 2: Coastal landscape including Maphelane and Lake St Lucia in the iSimangaliso Wetland Park. South Africa's estuarine, freshwater and coastal ecosystems face numerous pressures and are highly threatened. Photograph supplied: iSimangaliso Wetland Park.

The study found that major pressures on South Africa's biodiversity are habitat loss, changes to freshwater flow, overuse of some species, pollution, climate change and invasive alien species. Approximately 99% of estuarine area and 88% of wetland area in South Africa is threatened, and less than 2% of their extent is in the Well Protected category. The restoration and protection of these small ecosystems is a priority to secure the essential benefits that they provide to people and species.

Nonetheless, efforts to protect our biodiversity are showing promising outcomes, as over two-thirds of ecosystem types and 63% of species assessed are represented in protected areas. Some exciting news is that protected areas have expanded in the ocean and on land, and continue to be a source of national pride and heritage for South Africans. Continued expansion will help to ensure biodiversity conservation, ecological sustainability and even more social and economic benefits from biodiversity to society. The 20 new Marine Protected Areas (MPAs) declared in 2019 ensure that 5% of the country's mainland marine territory and 87% of marine ecosystem types have some protection.

Figure 3: The Red Roman (*Chrysoblephus laticeps*) is found only on South Africa's near-shore reefs. Photographer: Steve Benjamin.

Setting global trends: the National Biodiversity Assessment

South Africa is the only megadiverse country in the world that has produced its third NBA, making it a global trendsetter. The comprehensive scientific information in the NBA will assist with the country's international reporting obligations – such as the Country Report for the Convention on Biological Diversity and for South Africa's reporting against the Sustainable Development Goals.

The fact that South Africa is committed to doing regular assessments and reporting of its biodiversity status is helping to ensure that we retain our status as one of 17 megadiverse nations (countries that together contain more than two-thirds of the world's biodiversity) and occupy a position as one of the top three nations when it comes to plant and marine species found nowhere else on Earth.

Biodiversity science serves policy and society

The South African economy's economic growth is inextricably linked to the state of its biodiversity. The NBA has noted that up to 418 000 jobs in the country are related to biodiversity, signalling it as a key driver and contributor towards the country's economy. Biodiversity tourism is worth R31 billion to our economy each year. The more than 2 000 medicinal plant species in South Africa support an African traditional medicine industry worth about R18 billion annually. The NBA will enable the government to strategically deal with the country's water scarcity and habitat degradation issues and curb the pressures on indigenous species in the country.

Biodiversity also benefits us in our everyday lives. The findings of the assessment are presented in a useful way wherein the direct dependencies of humanity and nature are provided. Insects pollinate our crops, wetland and river plants clean our water, estuaries are nurseries for our commercial fish species, and ecosystems like kelp forests and dunes protect us from large waves and sea-level rise.

The overall results call for momentous change, as South Africa's biodiversity is abundant, relatively well-protected, unevenly distributed geographically, but facing extreme pressure. The United Nations General Assembly has declared 2021–2030 the 'UN Decade on Ecosystem Restoration', which aims to massively scale up the restoration of degraded and destroyed ecosystems as a proven measure to fight the climate crisis and enhance food security, water supply and biodiversity. As we enter this new decade of biodiversity, the scientific findings and priority actions from the NBA will serve as a valuable tool to guide South Africa's commitment to protect its natural assets now and into the future.

Figure 4: *Polhillia ignota*, a species thought to be extinct, was rediscovered by CREW volunteers in 2017, demonstrating the value of continued species monitoring and citizen science. Photograph supplied: SANBI.

Your participation matters

By becoming a citizen scientist you can get involved in the next NBA. To get involved, iNaturalist is an online citizen science platform to participate in, whilst the CREW programme is coordinated across the country.

For those of you who are already CREW volunteers, we thank you for all your monitoring data that helped us to include accurate statistics on the threat and protection level of South Africa's plants in this NBA.

The full set of NBA products, which include a synthesis report, seven technical reports, datasets, maps, supplementary materials and popular products, is accessible via http://nba.sanbi.org.za/.

Figure 5: The NBA synthesis report book is one of the many NBA products available on the website.

What it takes to do the NBA

The NBA took nearly five years to complete and involved 478 scientists, technicians, practitioners, interns and students. These contributors came from 93 different institutions, making it highly collaborative. Collectively, the contributors worked on this project for 75 person years during the five years. Over 90 young people contributed to this enormous body of work, showing its value in growing the biodiversity scientists of the future.

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