Custodians of Rare and Endangered Wildflowers (CREW) Programme

Annual Report 2019/2020

SANBI Biodiversity for Life
South African National Biodiversity Institute

C·R·E·W
CUSTODIANS OF RARE & ENDANGERED WILDFLOWERS

BOTANICAL SOCIETY OF SOUTH AFRICA

Mapula Trust

Table of Contents

A. Background 3

B. CREW Deliverables in line with Operations Plan 4

1. Manage a network of citizen scientists across South Africa to survey and conserve taxa of conservation concern (TOCC) 4

2. Expand the network of volunteers 6

3. Conduct surveys for species from priority areas under imminent threat 6

4. Support provincial biodiversity stewardship work 7

5. Prioritise *ex situ* plant conservation 8

6. Sustainable Use of South Africa's plants 9

7. Indigenous and local knowledge of South Africa's plants 9

8. Promote plant conservation education and awareness 10

9. Contribute to human capital development in plant conservation 12

C. CREW Financial Report 2019/2020 12

D. CREW Team Profile 13

A. Background

The Custodians of Rare and Endangered Wildflowers (CREW) Programme involves citizens from different socio-economic backgrounds to collect specific monitoring information when surveying South Africa's plant taxa of conservation concern. In addition to capacitating the network of citizen scientists, the CREW Programme links its citizen scientists with their local conservation agencies and particularly with provincial biodiversity stewardship programmes to ensure the conservation of key sites for threatened plant species. Funded by the South African National Biodiversity Institute (SANBI), the Botanical Society of South Africa (BotSoc), with the operations of the Cape Floristic Region being funded by the Mapula Trust, this citizen science programme is an integral part of the work on monitoring threatened species for South Africa. Thus, the CREW programme is imbedded within the SANBI's Threatened Species Unit, which feeds into 9 of the 16 targets of South Africa's (National) Strategy for Plant Conservation (NSPC).

Initiated in 2003 in the Cape Floristic Region (CFR) the CREW programme expanded to the KwaZulu-Natal province in 2006, Mpumalanga in 2007, Eastern Cape and Limpopo in 2013 and Gauteng in 2015. There are currently 3 CREW nodes –CFR node supporting the Northern and Western Cape provinces, Eastern Cape node supporting 4 regions (Albany, the coastal band, Former Transkei and the EC Drakensberg) within the province and the summer-rainfall node supporting KZN, Gauteng, Mpumalanga and Limpopo provinces. CREW doesn't work in the Free State and North West provinces due to low number of threatened plants occurring in these provinces (figure 1).

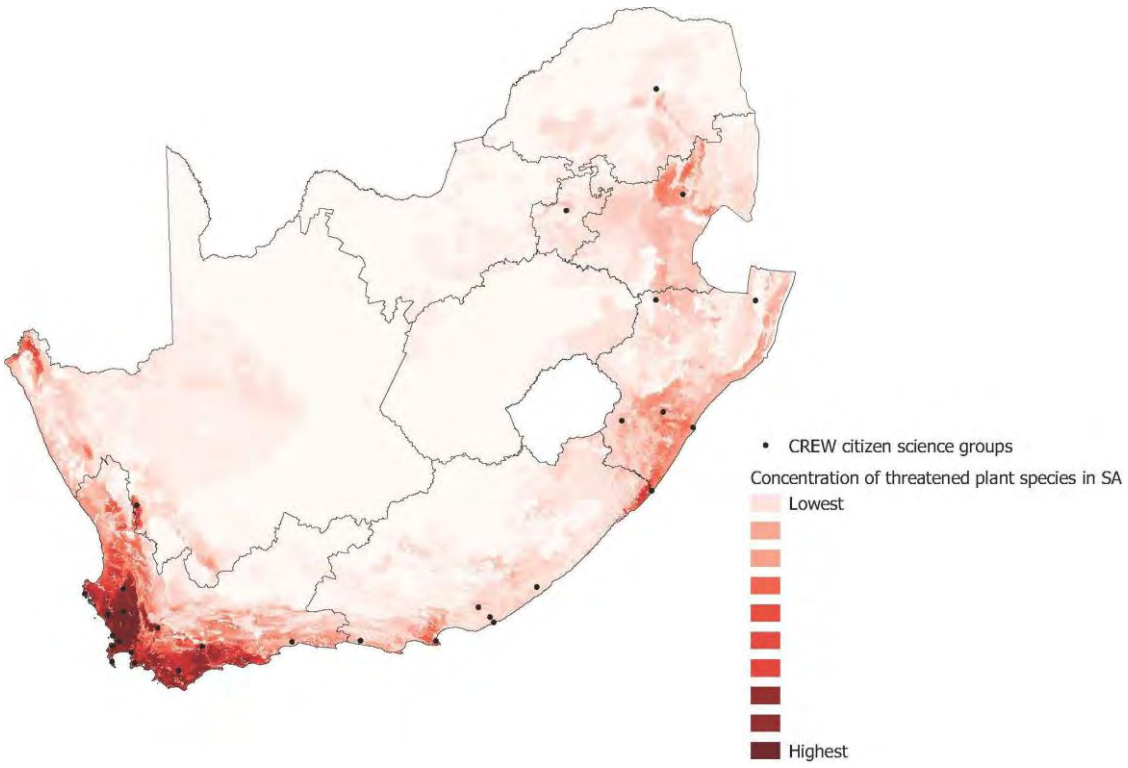


Figure 1: Map illustrating locality of CREW groups

The map above illustrates where each of the groups are located, which is in line with the national representation of areas of high concentrations of taxa of conservation concern.

B. CREW Deliverables in line with Operations Plan

The CREW programme's objectives are in line with the targets of the National Strategy for Plant Conservation.

1. Manage a network of citizen scientists across South Africa to survey and conserve taxa of conservation concern (TOCC)

This objective describes the primary purpose of the CREW programme whereby each node coordinates activities to assist the citizen scientist network in data collection. This objective is linked to Target 3 of the National Strategy for Plant Conservation.

1.1TOCC targets

The CREW nodes plan for the field-season by prioritising taxa of conservation concern (TOCC) which are threatened and restricted range species to be surveyed by conducting planning meetings with each CREW group. The fieldtrip schedule detailing the species, flowering time, locality, and if possible land-owner detail is then shared by the node.

The graph below details the number of taxa of conservation concern (TOCC) surveyed by the CREW network. Over the past year, the CFR node surveyed 637 TOCC in 2 provinces – Western Cape and Northern Cape – and piloted data collection via iNaturalist. The EC node increased the number of TOCC surveyed from 23 in 2018 to 48 in 2019. Over the past year, the SRR node prioritised sampling for threatened species which deemed much more difficult than species listed as Near Threatened, Rare and Data Deficient.

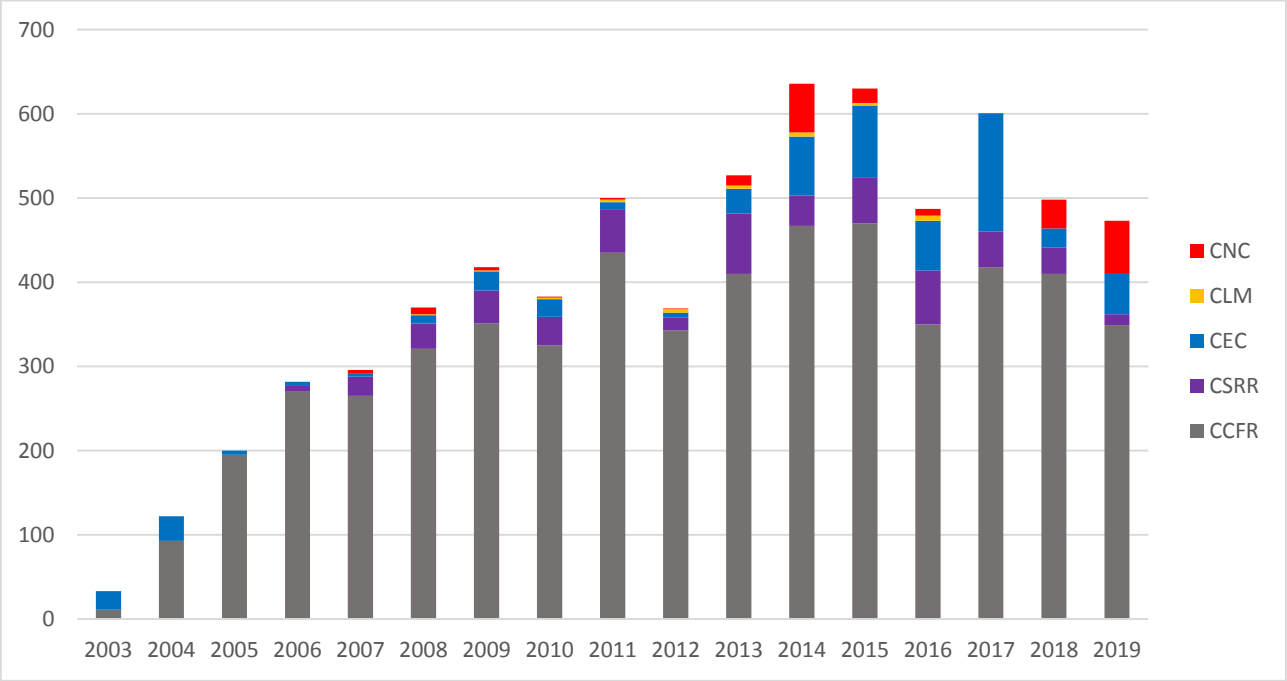


Figure 2: Number of TOCC surveyed by CREW over time

1.2 Sites targeted

As part of the way CREW operates, some sites are surveyed repeatedly while others are targeted as they contain historical records for taxa of conservation concern or they have the correct habitat to house such species. The CREW programme has maintained an above average number of sites visited.

Similar to Figure 2, the graph below illustrates the number of sites surveyed by the CREW citizen scientists since the inception of the CREW programme. Both the CFR and EC nodes has increased the number of sites surveyed over the past year with the Northern Cape being prioritised by the CFR node.

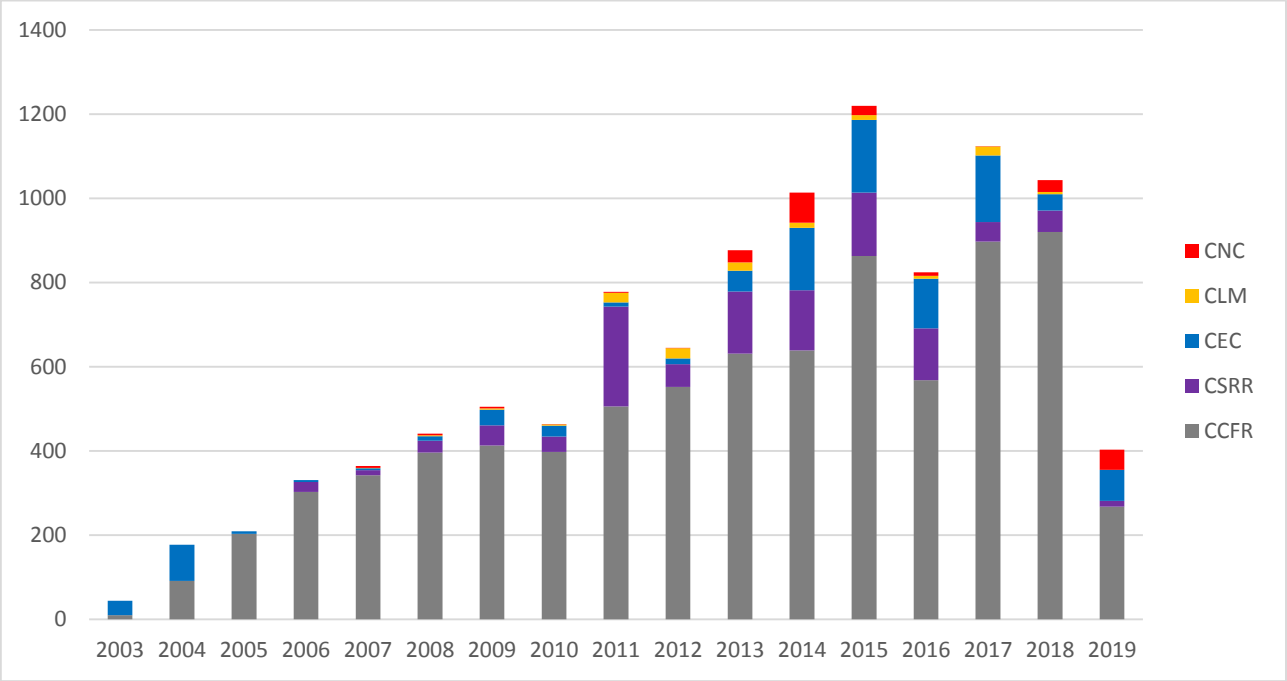


Figure 3: Number of sites surveyed by CREW over time

1.3 Support materials to equip citizen scientists to identify TOCC

Several of the TOCC are not captured in field guides and most provinces do not have a substantial conspectus. Thus compiling identification sheets for each TOCC by synthesising species descriptions from botanical literature and sourcing images (photographs, illustrations, or herbarium specimen) has been a necessity for each node since the inception of the CREW programme. This resource bridges the gap between a botanist and a volunteer with limited botanical terminology. SANBI will soon be serving all available plant species descriptions online which will be a significant support to citizen scientists going forward.

1.4 Data collection quality-control and improvement

The CREW programme has developed a CREW project on the iNaturalist platform to enable our citizen scientists to submit data via this platform as well as traditional data collection methods. This has seen a radical increase in data however, the data-mining process is time-consuming. This risk will be tabled for discussion at the next CREW biannual strategic planning session.

Specimen collection in the summer-rainfall region is much higher than that in the Cape Floristic Region due to the duration of the node's operation (the CFR node started in 2003 and has been operating for 17 years). The summer rainfall region still has many under-sampled regions. The KZN node has lodged 574 specimens at the National Herbarium whereas the EC node lodged 109 specimens at the Selmar Schonland Herbarium during this reporting period.

2. Expand the network of volunteers

Both the CFR and KZN nodes have experienced a drop in activity in the well-established groups due to long-standing citizen scientists ageing to a point where they are unable to continue intense fieldwork. We have focussed on recruiting new members to these CREW groups to ensure the sustainability.

One of the CFR node's intern was tasked to conduct a series of fieldtrips in the Northern Cape, in view of the imminent threats the province is facing. These fieldtrips have initiated new partnerships and laid the foundation for the CREW programme to expand into a CREW Northern Cape node.

With the Limpopo node not operational over 2019 due to resignation of the co-ordinator, fieldwork and data collection from both the PSG and Limpopo CREW groups have reduced. We would like to resurrect this node in the next year or 2.

The work undertaken by the CREW Citizen scientists is illustrated in the annual newsletter.

3. Conduct surveys for species from priority areas under imminent threat

The National Biodiversity Assessment Report 2019 has detailed habitat loss (as a result of clearing natural vegetation for field crops, horticultural crops and pastures) to be the most significant pressure facing South Africa's biodiversity. Analysis of plant data over 3 decades shows an increase in threat status with the main pressures being invasive plant species, crop cultivation, urban development, and habitat degradation as a result of livestock overgrazing. Thus, the CREW programme had undertaken long- term monitoring projects as well as surveying species occurring in restricted geographic range.

3.1 Demographic monitoring pilot projects

Analysis from the 2 pilot demographic monitoring reveal no significant changes in data collected annually thus this monitoring will occur every 5 years. The CFR node is in the process of drafting a lessons learnt document for this project.

3.2 Survey for critical habitat species

In line with Target 7 of the NSPC, the CREW programme has been surveying those TOCC with a highly restricted geographic range occurring in an area of less than 10 km^2. The data collected will enable the accurate identification of sites requiring legal protection. Many of these 537 species occur in hard to reach places and are sometimes taxonomically challenging to identify. Below is a summary of the species that has thus far been surveyed.

Table 1: The number of Critical Habitat Species per CREW node versus the number of species searched for and found

CREW Node	No. of Critical Habitats for node	No. of species surveyed	No. species found
CFR Node	453	150	150
Eastern Cape Node	24	16	6
KZN Node	24	15	13

4. Support provincial biodiversity stewardship work

All CREW nodes actively participate in the Biodiversity Stewardship Programme Working Groups in their respective provinces whereby sites selected for inclusion in South Africa's Protected Area network via the stewardship process are discussed. The CREW nodes encourages the working group to prioritise poorly protected or unprotected ecosystems. Each site is assessed by desktop analysis for possible species occurring on the site, botanical surveys are carried out to ground-truth species occurring on the site, concerns highlighted by CREW citizen scientists who may have a close-eye on the site are raised, and recommendations on the management plan for the particular site is made. Over the past year CREW has contributed to management plans and discussions for 34 sites, bringing our total contribution over the duration of the programme to 236 sites.

Table 2: List of stewardship sites CREW engaged with during 2019-20209 field season

CREW Node	Partners	Site	Stewardship Activity
C-KZN	Conservation Outcomes	Gxumisa Traditional Authority Area	Site Assessment
		Babanango Nature Reserve	Site assessment
		Monks Cowl Assessment - Farm Rood	Site assessment
C-EC	Eastern Cape Parks and Tourism Agency (ECPTA)	Mthathi	Site assessment
		North-East Grassland	Site assessment
		Chief Makhoba	Site assessment
		Baleni	Site assessment
		Maluti escarpment	Site assessment
	Conservation Outcomes	Vorentoe	Botanical survey
C-CFR	Drakenstein municipality	Orleans Campsite	Botanical survey and restoration
		Wellington Industrial site	Site sampling
		Gouda conservation area	Site sampling
	Swartland municipality	Malmesbury Klipkoppie	Botanical survey
		Malmesbury Driehoekpad	Botanical survey
	SANParks	Tanqua National Park Extension	Site sampling

	Cape Nature	Tortoise reserve Worcester	Threatened species search
		Groenlandberg Conservancy – Cluver Wine Estate	Botanical survey
		KolKol Private Nature Reserve	Botanical survey
		Sea Farm Private Nature Reserve	Botanical survey
		Elandsberg Stewardship Reserve	Botanical survey
		Bokbaai Stewardship Reserve	Threatened species search
		Shaws Pass conservation area	Threatened species search
	Nuwejaars Wetland Special Management Area	Heidehof Farm	Botanical survey
		Groot Hagelkraal Private Nature Reserve	Threatened species search
		Mierkraal	Threatened species search
		Rooiwal	Site sampling
		Elim Commonage	Site sampling
	Northern Cape Department of Environment and Nature Conservation (DENC)	Karassberge Protected Environment	Threatened species search
	DENC/WWF	Avontuur	Threatened species search
	Overberg Renosterveld Conservation Trust (ORCT)	Haarwegskloof Renosterveld Reserve	Botanical survey
	City of Cape Town (COCT)	Van Schoorsdrift	Botanical survey
		Kalbaskraal Stewardship Reserve	Botanical survey
		Schoongesight Stewardship Reserve	Threatened species search and bioblitz
		Fynbos Farm	Botanical survey

5. Prioritise *ex situ* plant conservation

Target 8 of the National Strategy for Plant Conservation stipulates the conservation of threatened plants in *ex situ* collections and available for recovery (restoration) programmes. Living collections of threatened species are kept in pot collections in the national botanical gardens. Seeds are also banked via the Millennium Seed Bank Partnership (MSBP) project.

5.1 Assist SANBI's NBG to prioritise TOCC for living collections

The CFR node manager has participated in 2 annual horticulturalist workshops to assist the NBG. The KZN node manager met with both Gauteng NBG horticulturalists to allow for them to engage with the CREW Gauteng group and the National Herbarium scientists to enable joint fieldtrips. Sadly, thus far horticulturalists have not yet reached out to volunteer groups, new mechanisms for facilitating such co-operations are being explored. The CEC node is actively engaging with the Kwelera NBG staff to ensure threatened species, especially those occurring outside the formally protected areas, are prioritized for both living collections and seed banking.

5.2 Assist SANBI's Millennium Seedbank Partnership (MSBP) project to prioritise TOCC for seed collection

The collaboration is effective in the CFR and EC as MSBP staff are based in the same region as the CREW node, the CREW staff and volunteers mark plants and alert MSB teams where to collect the seed. Furthermore CREW citizen scientists collect seed for the MSBP, over 25% of seed collected for the MSBP over the past 4 years comes from the CREW volunteer network. Support in prioritising species was provided to the Limpopo MSB unit however very little data has been collated, both CREW and MSBP managers are in discussion to ensure this and other gap areas are targeted over the next five years.

5.3 Initiate and implement additional funded projects for recovery work

The CFR node was awarded funding from the Mohamed bin Zayd Species Conservation Fund to conduct recovery work for *Marasmodes undulata*. This project has allowed for new partnerships to be formalised with the local municipality, landowners and the provincial Biodiversity Stewardship Programme.

6. Sustainable Use of South Africa's plants

The national Threatened or Protected Species (TOPS) List is an inventory of species threatened or declining due to utilisation (collecting for the specialist horticultural trade, medicinal plant collecting for trade in local muthi markets, cut flower harvesting, and harvesting for formal biotrade). With ongoing fieldwork, the CREW team is able to pick up impacts on particular plant groups which is then made available to those producing regulations to protect these species including South Africa’s Scientific Authority.

Red List analysis reflect a major impact on the genus *Conophytum* due to illegal succulent plant trade. Significantly, 34 species have increased in their threat status in the last five years with 12 species being up listed to Critically Endangered. As Chair of the AZEF organising committee, the CFR node manager organised a series of workshops to discuss the issue of illegal trade of succulent plants with a wide range of stakeholders. A number of new initiatives involving a broad range of stakeholders are now underway to address this rapidly growing illegal trade.

7. Indigenous and local knowledge of South Africa's plants

South Africa’s biological diversity is well documented, as compared to its cultural diversity celebrated in the 11 official languages. South Africa has recently legislated the Indigenous Knowledge Systems (IKS) policy to protect, promote and develop indigenous knowledge, thus mandating the Department of Science and Innovation’s Indigenous Knowledge Systems (IKS) project. However, in its 5th year of operation, the project has not achieved its objectives with one of the key challenges being the correct identification of the plants for which IK is being gathered. The CREW programme is currently working with both KZN and Limpopo IKS coordinators to establish protocols for effective plant identification. iNaturalist training has been organised for the IKS teams in KZN and further options to expand and promote collaboration with this project are being explored.

8. Promote plant conservation education and awareness

8.1 Conduct plant awareness activities with school learners

The CFR node had conducted their annual winter- and summer-school activities with the Nieuwoudtville community in the Northern Cape while the EC node were hosted by 2 primary schools in Bathurst for plant conservation activities. The KZN node partnered with the Botanical Society KZN Coastal Branch to conduct plant conservation awareness at the Eden College eco-school.

8.2 Conduct plant awareness activities with higher education institutes across South Africa

Over the past decade, the CREW programme has gradually increased its reach to higher education institutes. This engagement is increasing the number of internship applications from students interested in plant conservation as well as an increase in the number of students participating in some CREW groups' fieldtrips. The Fees Must Fall Campaign over the year has resulted in cancellations of several of our planned engagements with those we managed to conduct tabled below.

Table 3: List of higher education institutes CREW engages with on an annual basis

	Higher Education Institute	Contact	Date of engagement in 2018
1	University of Mpumalanga	Wilfred Mbeng	April 2019
2	Tshwane University of Technology	Xander Combrink	April 2019
3	University of Pretoria	Peter le Roux	May 2019
4	University of the Witwatersrand	Glynis Goodman-Cron	April 2019
5	University of Johannesburg	Annah Moteetee	April 2019
6	University of the North West (Potchefstroom campus)	Stefan Siebert	August 2019
7	University of the North West (Mafikeng campus)	Madeleen Struwig	August 2019
8	Sol Plaatjies University	Doug Harebottle	August 2019
9	University of KZN (PMB campus)	Benny Bytebier	August 2019
10	Mangosuthu University of Technology	Kuben Naidoo	September 2019
11	Durban University of Technology	Jonathan Foley	May 2019 (2 sessions)
12	University Fort Hare	Chris Cupido	October 2019
13	Rhodes University	Tracey Nowel	February 2020
14	University of the Western Cape	Stephen Boatwright	April 2019 Lectures May 2019 Honours Camp
15	Cape Peninsula University of Technology	Sjirk Geerts	April 2019 (2 sessions)
16	University of Stellenbosch	Francios Roets	May 2019

8.3 City Nature Challenge

South Africa participated in the City Nature Challenge run on the iNaturalist platform aimed to involve the public to document the biodiversity in their city, for the first time on 24-27 April with Cape Town participating (see https://citynaturechallenge.org/). The CREW CFR team was part of the organising committee whereby CREW citizen scientists and others were encouraged to participate. Cape Town won two of three categories of the Challenge; with the overall statistics reflecting that CREW citizen scientists contributed to 9558 observations and recorded 1932 species. Furthermore, several of our volunteers were listed in the Top 20 identifiers.

8.4 Conduct Bioblitzes

The KZN node 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. In this second year of the project, 3 nature reserves in the Zululand region – Entumeni nature reserve, Dlinza forest reserve and Lebombo mountain reserve were visited. Being under-sampled areas, a large number of specimens were collected during each bioblitz which are still undergoing the specimen identification process.

The CFR node organised over 15 Bioblitzes across the City of Cape Town during the City Nature Challenge.

8.5 Conferences and forums

The CREW programme is well represented at the major events across the country. The CEC node presents at the Thicket Forum while the summer-rainfall team presented at the Conservation Symposium. The CFR node participates and presents different aspects of CREW work at the Fynbos Forum and Arid Zone Ecology Forum. Some of the CFR node team also attended the international restoration conference - SER 2019.

8.6 CREW Newsletter

The 56-page illustrated newsletter details activities undertaken by each node and all the CREW groups as well as feature articles of projects of interest in plant conservation. The annual newsletter is available in both electronic and paper formats to enable wide distribution with the programme's funders, stakeholders within SANBI and outside the organisation.

8.7 Publications

In the last year, the CREW team have produced 31 publications. The programme has contributed to the Veld and Flora Journal, SANBI's Plant of Week series, SANBI's Animal of the Week series, SANBI's Newsroom and the Plant Life blog.

The CREW programme's Facebook profile has been receiving much attention from local and international followers, as we run three botanical themed infographics series on a weekly basis, namely Medicinal Monday, Threatened plant Tuesday and Plant Family Friday. During this reporting period the number of followers increased from 3502 to 4295.

9. Contribute to human capital development in plant conservation

9.1 Mentoring interns

Over the past year the CREW programme has mentored 9 interns – funded by Groen Sebenza, WWF-SA, Botanical Society, Joan Wrench Scholarship Fund and Mapula Trust. Each intern worked on specific projects as well as conducted fieldwork. Interns accompanied their mentor on fieldtrips and gradually became confident to conduct fieldwork without the mentor. One of the strategic planning sessions was focussed on sharing a combination of people skills, social skills and communication skills to equip our interns to navigate the workforce they will be entering into. The interns presented their work at the annual CREW workshops as well as in relevant symposia they participated in. Four of the 9 interns will continue their 2-year internship in 2020-2021.

9.2 Courses for CREW citizen scientists

Having accepted the City Nature Challenge the CFR team focussed on conducting 20 iNaturalist courses across the City of Cape Town to reach new users of this digital citizen science tool.

The EC team conducted the basic plant identification and plant specimen collection course, together with the MSBP for the seed collecting course, for the Umzimvubu Catchment Partnership Programme interns. These courses will equip the interns to collect much needed plant data in this region.

At the annual summer-rainfall workshop, the KZN team arranged for a beginner and intermediate tree hands-on course with a practical session at the Enseleni Nature Reserve. iNaturalist courses were reduced to 2 sessions during the course of the year as this was a major focus the year before.

C. CREW Financial Report 2019/2020

Annexure 1

SANBI
Biodiversity for Life
South African National Biodiversity Institute

Annexture 1

CREW Financial Report 2019/2020

Income Report

Funder	Description	Amount
SANBI	Salary: TSP Manager (20 % time)	R190 343
	Salary: CREW Manager	R682 498
	Salary: CREW Manager - CFR node	R676 108
	Salary: CREW coordinator - Eastern Cape	R417 435
	Salary: CREW Support officer - Cape Floristic Region	R162 586
	TOTAL	**R2 128 970**
Botanical Society of South Africa	Salary: CREW KZN coordinator	R240 000
	Salary: CREW EC project assistant	-
	Operations costs for summer-rainfall region	R408 462
	TOTAL	**R648 462**
Mapula Trust	Operations costs for CFR	R624 779
	TOTAL	**R624 779**
Total Income		**R3 402 211**

Expenditure Report

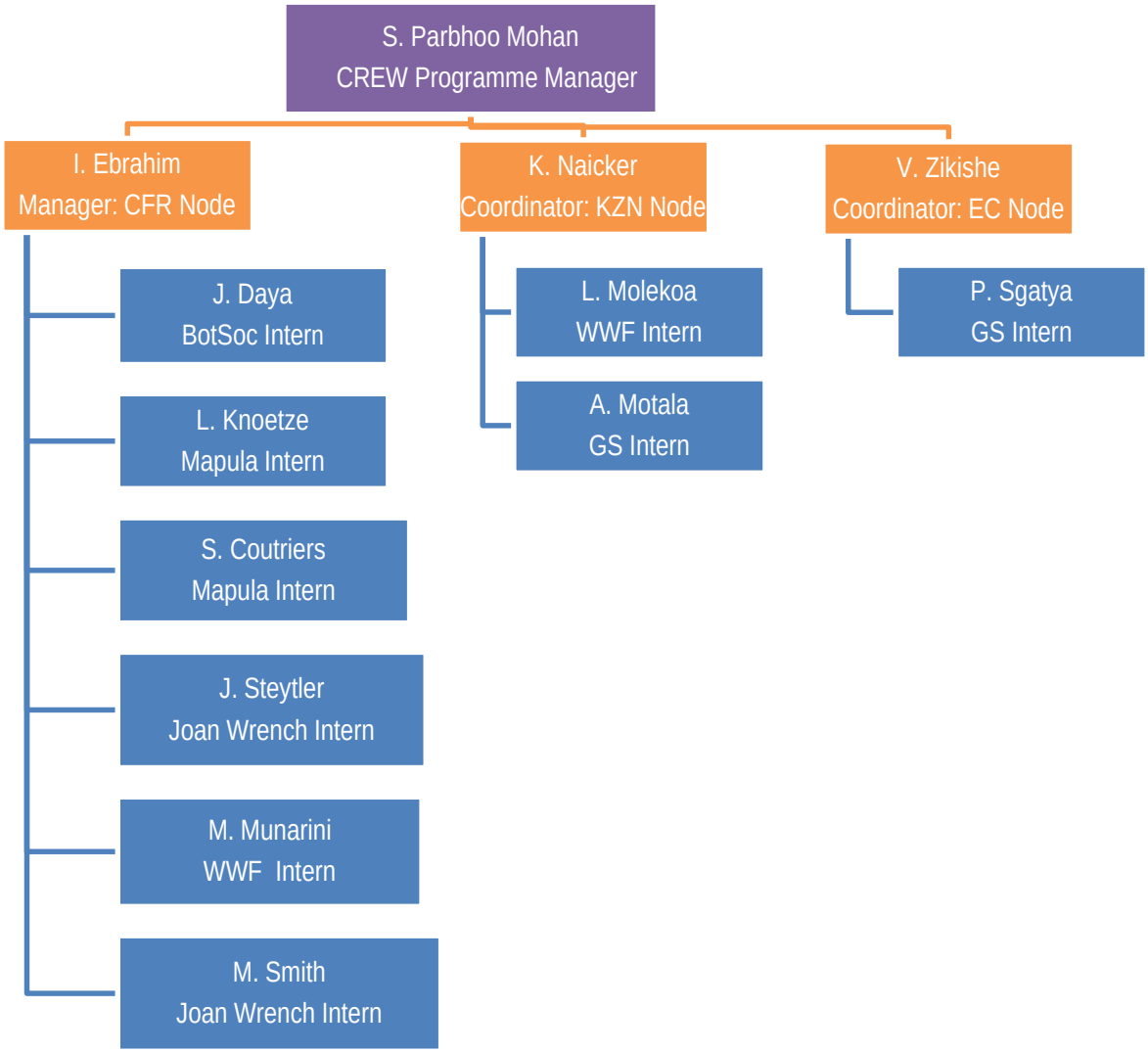
Budget Items	Cape Floristic Region		Summer-rainfall Region	
	Budget	Spent	Budget	Spent
Office costs	20 449	33 334	19 962	16 242
Computer equipment	28 051	0	15 000	3 224
Conferences, meetings	38 112	67 296	110 000	30 872
Travel for meetings	19 269	28 891	36 500	38 757
Fieldtrips	129 035	104 461	55 000	63 736
Field equipment	9 818	0	0	0
Vehicle usage	169 137	78 527	75 000	84 317
Annual Workshop	83 277	79 333	66 000	89 982
Support to CREW groups	92 568	22 956	0	0
Identification courses			0	0
Herbarium plant identification fee	21 038	16 960	5 000	0
Education activities	14 026	5 140	3 000	0
Student stipend		176 649	0	0
Marketing			20 000	4 162
Staff training			3 000	5 800
TOTAL	**624 779**	**613 546**	**408 462**	**337 092**
Total Expenditure	**950 637**			

26-Jun-20

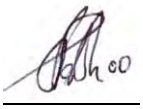
Alan Smith
Director: Finance

Date

D. CREW Team Profile



In closing, the CREW Programme would like to express our deepest gratitude to each of our supporters, mentors and citizen scientists, for their time and energy in surveying botanical rich sites in addition to adding Human Capital to the CREW Programme. We gratefully acknowledge the financial support of the Botanical Society of South Africa; the Mapula Trust and the South African National Biodiversity Institute.

Compiled by: 

Suvarna Parbhoo Mohan (Ms)

Designation: Manager Custodians of Rare and Endangered Wildflowers (CREW) Programme

Date: 31 March 2020