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National
Research
Foundation

DST-NRF Centre of Excellence
“Birds as Keys to Biodiversity Conservation”
FitzPatrick Institute of African Ornithology, UCT

ANNUAL PROGRESS REPORT 2019

Reporting Period
1 January - 31 December 2019

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CoE Identification

Name of Director	: Prof. Peter Ryan
Name of CoE	: DST-NRF Centre of Excellence at the FitzPatrick Institute of African Ornithology
Abbreviated CoE name	: FitzPatrick Institute CoE
Host Institution	: University of Cape Town
Date completed	: 13 February 2020

EXECUTIVE SUMMARY

1. Funding of the CoE for 2019

DST-NRF CoE funding for 2019	:	R 7 161 899
Carry forward from 2018	:	R 516 025
Interest earned during 2018	:	R 1 828
UCT URC support for Hotbirds project in 2019	:	R 358 095*
Funding from other sources for the CoE in 2019	:	R 15 309 893**
Total funding	:	R 23 347 740

* UCT's direct contribution to the CoE: 5.0% of R7 161 899

** funding from sources other than the DST-NRF or UCT URC 'hotbirds' grants (Table 15)

2. Summary of progress against Five Key Performance Areas

(i) Research

The CoE supported 27 research projects during 2019 including four new projects on using raptors to monitor environmental contamination in South Africa, waterbird dispersal of aquatic invasive weeds, Sociable Weaver nests and Camelthorn Trees, and on understanding the impacts of anthropogenic urban landscape structure on South African bird communities. The CoE had another good year with a new record of 155 papers published in peer-reviewed journals during 2019, including 45 in journals with an impact factor rating ≥ 3.5 , of which 28 were in journals with a rating ≥ 5 . CoE staff and students received various awards for research outputs and were invited to give keynote presentations at international and local scientific conferences.

(ii) Education and Training

A total of 71 postgraduate students (26 PhD, 44 MSc and one BSc Hons) registered at South African universities (28% black and 57% women) were supported by the CoE during 2019. Of the 47 South African students, six were 'Black', four 'Coloured' and four 'Indian', together comprising 30% of the South African students. Seventeen students graduated during 2019 (2 PhD, 3 MSc by dissertation, 11 MSc Conservation Biology and one BSc Honours). Eleven post-doctoral fellows were supported by the CoE during 2019.

(iii) Information Brokerage

CoE members published 54 popular articles and seven chapters in semi-technical books during 2019. CoE members attended 17 international and 11 local conferences and presented over 50 seminars and illustrated talks at universities, bird clubs and membership-based societies during 2019.

(iv) Networking

The CoE continued a broad range of close collaborative working relationships with at least 100 scientific peers and a variety of conservation NGOs and governmental organisations both nationally and internationally. The CoE continues to build much-needed African capacity in the broad arena of biodiversity conservation and has research projects in five other African countries.

(v) Service rendering

The CoE actively advised NGOs, government departments and industry on a variety of research and applied conservation topics. CoE members served on 31 journal editorial boards, 90 membership fora and advisory services, and reviewed 101 papers for 56 peer-reviewed journals during 2019 (Appendix 1).

Summary of FitzPatrick Institute CoE 2019 achievements against SLA 6 targets

SLA Output	SLA target	Achieved
Number of students	≥ 30	71
Women students	≥ 50%	57%
'Black' students*	≥ 30%	28%
Average duration of MSc degrees	≤ 2 yrs	2
Average duration of PhD degrees	≤ 4 yrs	4
Average duration upgraded PhDs	≤ 5 yrs	N/A for 2019
Number of Post-docs	≥ 6	11
Number of peer-reviewed papers	≥ 60	155
Papers with IF ≥ 3.5	≥ 15	45
Papers with IF ≥ 5	≥ 5	27
Joint venture training	≥ 2	2

*15 'Black' students = 50% of the SLA student number target

3. Red Flags/concerns for the future of the CoE

The DST sent a letter to UCT on 7 November 2019 confirming that a decision had been taken to fund the CoE at the current (2019) level for a further three years (2020-2022). The award letter stipulated that the CoE will draft a three-year business plan in early 2020, and that the current service level agreement (SLA 6) would apply but that bursaries must be awarded according to the ministerial guidelines regarding national/racial quotas. Although this is good news, it will be a significant challenge to meet the ministerial guideline targets, and the mid-term status of the CoE beyond 2022 remains uncertain.

4. General Comments

Following the commitment from the NRF in 2012 that the CoE will receive support for a third phase (2015-2019) with a minimum expectation of the same level of funding during 2015, a strategic plan and a sixth service level agreement (SLA 6) for 2015-2019 were approved by the CoE Steering Committee on 19 November 2014. The UCT Research Contracts Office also signed a renewed Memorandum of Agreement (MoA) between the NRF and UCT for 2015-2019, and renewed CoE collaboration MoAs with the University of Pretoria and the Nelson Mandela University. A collaborative partnership with the University of Limpopo and a renewed agreement with the University of the Witwatersrand resulted in MoAs being formalised during November 2017 and February 2018, respectively. This annual progress report represents the fifth and final year of SLA 6 and the current MoA between the NRF and UCT. The MoA is also extended for three years by the November 2019 award letter.

PROGRESS REPORT

1. Scientific Research

Objective

The CoE research strategy is aligned to a medium-term goal of producing world-class research outputs measured as the number of papers published in international peer-reviewed journals with high scientific impact-factor ratings. To meet this goal the CoE SLA 6 has a target of publishing ≥ 60 peer-reviewed publications each year during 2015–2019 with an average of ≥ 15 papers with an impact rating ≥ 3.5 of which 5 should have an impact factor ≥ 5 .

Progress

The CoE supported 27 research projects during 2019 including four new projects on using raptors to monitor environmental contamination in South Africa, waterbird dispersal of aquatic invasive weeds, Sociable Weaver nests and Camelthorn Trees, and on understanding the impacts of anthropogenic urban landscape structure on South African bird communities.

The CoE had another excellent year of scientific research publication output with a new record of 155 CoE papers published in peer-reviewed journals during 2019 (Appendix 2); 45 in journals with impact factors ≥ 3.5 , including 28 in journals with impact factors ≥ 5 (Fig. 1). The high quality of the publications is emphasised by the reduced proportion of papers in journals with IF ratings of < 1 and non-ranked journals.

CoE publications in peer-reviewed journals 2003–2019

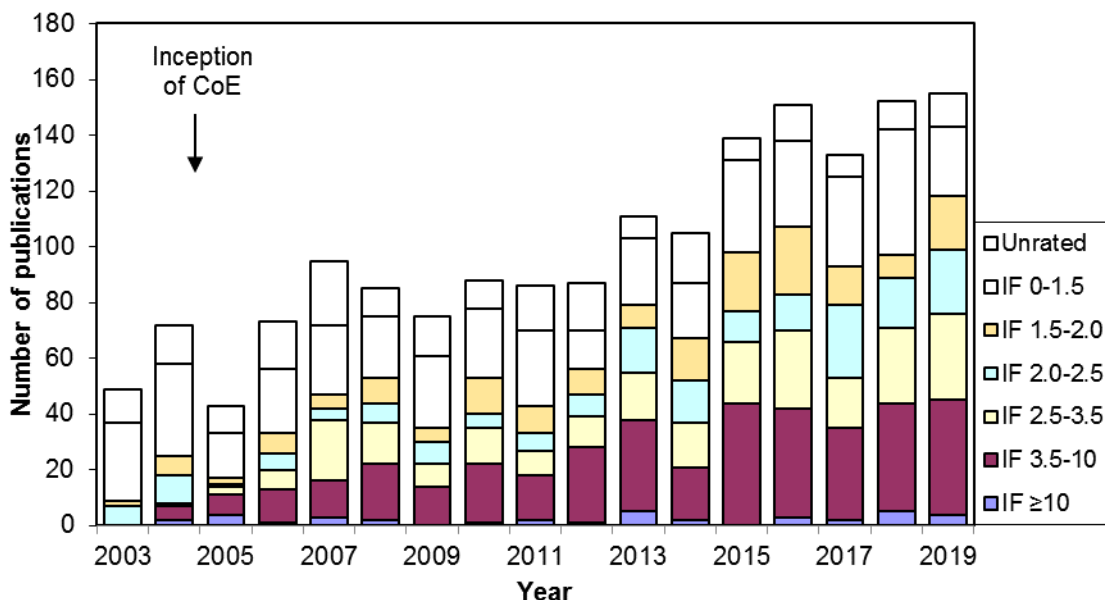


Figure 1. Trends in the number and quality of CoE publications (measured by journal 'Impact Factors' IF) since the establishment of the Centre of Excellence

Prof. Claire Spottiswoode was awarded the Gill Memorial Medal by BirdLife South Africa in May 2019 for her outstanding lifetime contributions to ornithology. She is the youngest

recipient of the medal amongst a group of southern Africa's distinguished ornithologists since its inaugural award in 1960. Prof. Spottiswoode also co-edited a special issue of the *Philosophical Transactions of the Royal Society B* on the theme "co-evolutionary biology of brood parasitism: from mechanism to pattern".

Post-doc Petra Sumasgutner received a Theodor Körner Fund award in Vienna, Austria on 10 May 2019 in recognition of scientific advances for her novel approach of extracting DNA from the feathers of falconry Golden Eagles *Aquila chrysaetos*.

Post-doc Megan Murgatroyd and A/Prof. Arjun Amar together with colleagues from the UK published a paper in the journal *Nature Communications* in March 2019 which received considerable media coverage. We often think wildlife crime doesn't exist in Europe or outside of developing countries but this research, which analysed satellite tracking data from Hen Harriers *Circus cyaneus*, identified widespread illegal killing of that species in areas managed for driven grouse hunting in Britain. This is a major wildlife crime which until now has been largely dismissed or denied by pro-hunting groups.

A scientific paper co-authored by Prof. Peter Ryan and PhD student Ben Dilley titled 'Seabird population changes following mammal eradication on islands' published in the journal *Animal Conservation* was one of the journal's top downloaded papers in the twelve months following its online publication on 31 March 2019. The paper generated immediate impact and visibility, contributing significantly to the advancement of seabird conservation. Peter and Ben's work on the impacts of invasive scale insects at the Tristan da Cunha group has resulted in a Darwin Fund grant being awarded to the RSPB to hopefully introduce biocontrol wasps to limit their impacts on Island Trees *Phyllica arborea*. Peter and Ben also published a paper with Maëlle Connan (NMU) and Rob Ronconi (Canadian Wildlife Service) in the prestigious *Proceedings of the National Academy of Sciences of the U.S.A.* on the rapid growth of bottle litter at Inaccessible Island over the last few decades which refocuses attention on the role of shipping as a source of marine litter.

A/Prof. Arjun Amar, CoE core team member Dr Chevonne Reynolds at Wits University, Dr Dominic Henry (former CoE PhD student now at the Endangered Wildlife Trust) and colleagues from the University of Turin published a paper titled 'Snobbish birds prefer to live in luxury' in May 2019. They studied birdlife in 22 urban areas in South Africa and found that species richness increased according to the income level of the neighbourhood, but not in highly urbanised areas where vegetation has all but disappeared. The so-called 'luxury effect', well-documented in the developed world, also applies to relatively low-density urban areas in South Africa, where rich areas have a greater diversity of bird species than poor areas. This is probably because in wealthier neighbourhoods there is more investment in gardens, parks and other green spaces which are hotspots of urban biodiversity. However, birds have no appetite for heavily built-up areas, even when they have wealthy inhabitants. This is the first time the 'luxury effect' in birds has been documented in Africa.

A 2019 scientific paper co-authored by Honorary Research Associate Dr Phoebe Barnard titled "World scientists' warning of a climate emergency" published in *BioScience* achieved Altmetrics impact statistics rankings of top paper of 316 337 papers for the last 2-3 months and number 4 of 14.1 million papers since Altmetrics started analysing these impacts in 2011. This paper also has been featured by CNN, BBC, MSNBC, Fox News, The Guardian, New Statesman, Daily Maverick and multiple radio and TV stations in South Africa, France, Israel, UK, USA, Australia and other countries.

The 'Hot Birds' programme celebrated its 10-year anniversary with a workshop held at Gobabeb in the central Namib. A paper summarising the likely impacts of climate change on Kalahari bird communities was published in the *Proceedings of the National Academy of Sciences (PNAS)* of the U.S.A.

Two papers by previous CoE PhD student Tshifhiwa Mandiwana-Neudani, Profs Tim Crowe and Rauri Bowie, and Dr Rob Little on the taxonomy, phylogeny and biogeography of African spurfowls and francolins based on morpho-behavioural and genetic evidence, tested the classification of spurfowls and francolins. They recommend the genus *Pternistis* for the spurfowls comprising 25 species, increasing the currently recognised number of species by two and decreasing the number of subspecies from 59 to 16. They proposed five genera; *Francolinus*, *Ortygornis*, *Peliperdix*, *Campocolinus* and *Scleroptila* for the francolins, with *Campocolinus* as a new genus for the red-tailed francolins. They also recommended elevating 14 subspecies to species level and lumping other subspecies into more inclusive entities with only 14 subspecies in contrast to 52 previously. These findings have been presented to the International Ornithological Congress World Bird List committee for consideration and to the IUCN SSC Galliformes Specialist Group.

PhD student Carla du Toit visited the Smithsonian Museum of Natural History and the American Natural History Museum during 2019 and collected the most comprehensive dataset to date on beak anatomy and morphology in birds including paleontological data providing insight into the evolution of avian sensory systems.

Dr Rob Little participated in the UCT Research Symposium to enhance UCT's research endeavor and impact towards its 2030 strategic vision on 7 November 2019.

2. Education and Training

Objective

The short-term objective of the SLA 6 is for the CoE to support (at least partially) an average of ≥ 30 postgraduate students and six Post-doctoral Fellows each year during 2015-2019. A further target is for 'Black' students to comprise $\geq 30\%$ and women students to comprise $\geq 50\%$ of the students supported by the CoE. A medium- to long-term objective is to continue to build a vibrant research environment that instils a rigorous hypothetico-deductive approach to problem solving among the postgraduate students.

Progress

Twenty-six PhD, 44 MSc and one BSc Hons students (total = 71) registered at South African universities were supported at least in part by the CoE during 2019 (Tables 1 & 8). Of these, 20 (28%) were 'Black' and 40 (57%) were women (Tables 9 & 10). Of the 47 South African students, six were 'Black', four 'Coloured' and four 'Indian', together comprising 30% of the South African students. Regarding the nationality of the students, 48 (67%) were South African, 4 (6%) were from other SADC countries, 4 (6%) were from the rest of Africa and 15 (21%) were from the rest of the world (Table 11). The excess of international students (target 4%), which reduces the proportion of South African students (target 87%), largely results from the international student component of the Conservation Biology (CB) MSc classes. The recognized strengths of the CB course are the diversity of student backgrounds and the contribution to UCT's internationalization objective. None of the international CB students were awarded bursary support from the DST-NRF CoE grant.

Seventeen students graduated during 2019: 2 PhD, 3 MSc by dissertation, 11 MSc Conservation Biology and one BSc Honours. Gwendoline Traisnel and Ben Dilley were awarded PhDs, Laurie Johnson, Sekgwari Malemetja and Ditiro Moloto were awarded MScs by dissertation, Kerry-Ann Grey, Sandra Hörbst, Xolani Mabaso, Amy Hoffenberg, Rebecca Muller, Thinabakho Ncube, Michelle Schroeder, Clara Steyn, Daryl van der Merwe, Olivia Venter and Joshua Wiess were awarded MScs in Conservation Biology (all UCT), and Shamiso Banda (NMU) completed her BSc Hons.

Eleven Post-docs were supported by the CoE during 2019 (Tables 1 & 7). Jessica van der Wal, Pietro D'Amelio, Chima Nwaogu and Ben Dilley joined the CoE as Post-docs during 2019 to work on honeyguide mutualism, socialism in birds, urban raptors and seabird conservation, respectively. Post-doc Dayo Osinubi left the CoE at the end of February 2019 to join BirdLife International as their Conservation Programmes Coordinator in the BirdLife Africa Partnership Secretariat, Accra, Ghana, on 1 March 2019. Megan Murgatroyd left the CoE at the end of June 2019 to join Hawk Watch with the Endangered Wildlife Trust. Petra Sumasgutner left the CoE at the end of July to join the Konrad Lorenz Institute for Behavioural Biology in Grünau and the Department of Cognitive Biology at the University of Vienna, Austria. Alistair McInnes also left the CoE at the end of July 2019 to join BirdLife South Africa as their Seabird Programme manager.

An NRF intern Kim Hunt was appointed during 2019 to collate and manage the bird ringing (SAFRING) data and logistics.

Table 1. Number of CoE Post-docs and students supported during 2005–2019

	Year (2000s)														
	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19
P-doc	6	9	8	9	12	11	12	13	12	15	8	9	9	8	11
PhD	8	13	18	19	15	18	21	19	21	23	20	27	25	22	25
MSc	8	6	5	7	6	7	6	13	19	20	21	15	18	15	22
CB	11	14	12	11	11	12	13	15	13	13	13	14	13	13	11
CB ₂	15	11	14	12	11	11	12	12	15	13	13	12	14	11	11
Hons	0	9	6	8	2	2	7	1	0	3	1	3	2	2	1
Tot - CB ₂	33	51	49	54	46	50	59	61	65	74	63	68	67	60	70
Tot + CB ₂	48	62	63	66	57	61	71	73	80	87	76	80	81	71	81

2005 = start of CoE; MSc CB₂ = second year of a CB MSc class cohort

The MSc Conservation Biology Course has continued to build much-needed capacity within and outside of South Africa in the broad area of biodiversity conservation, with the graduation of students from SA (x9), Austria and the USA, and the enrolment of students from SA (x5), UK (x2), USA (x2), Cape Verde and Zimbabwe during 2019.

Six students participated on a certification course during 2019 to fulfil the requirement that researchers working with wild birds are certified by a vet before they can legally take blood samples from their study species (or have a vet present when they do it). The UCT Animal Ethics Committee (AEC) is keen to ensure that UCT is compliant with these rules.

Twenty-two CoE Hot Birds Research Project (HBRP) team members and collaborators held a 10th anniversary project workshop in Gobabeb, Namibia during July 2019 where

they discussed past success and where the research is expected to go in the future. CoE Post-graduates presented their sub-projects (finishing up, midway, and just beginning), and the core team members gave overviews of the broad-scale applications possible from 10 years of research. The CoE team was especially thankful of the presence of international collaborator Dr Blair Wolf and his PhD student Shayne Halter, and new collaborator A/Prof. Michael Kearney who showed the team some exciting new avenues for research using niche mapping.

Visiting statistical and R programme expert Dr Dylan Childs from the University of Sheffield facilitated a workshop on R 'tidyverse' for CoE staff and students on 18 September 2019.

Post-docs Diana Bolopo and Anina Coetzee were awarded Claude Leon scholarships for 2019. Jessica van der Wal is Secretary of the UCT Post-doc Researchers Association.

3. Information Brokerage

Objective

Medium- to long-term objectives are to: (1) make a sustained contribution to the popular literature aimed at science communication in the fields of conservation biology in general and ornithology in particular; (2) provide expert views on relevant matters for newspaper and magazine articles; and (3) contribute to books of a semi-technical nature. The CoE also has a SLA 6 target to organize at least one local conference during 2015–2019.

Progress

The transfer of the Animal Demography Unit (ADU) databases to the CoE in January 2018 significantly increased the information brokerage capacity of the institute. The information system specialists Dr Rene Navarro and Michael Brooks have been transferred to the CoE thanks to funding from the Department of Environmental Affairs, routed through SANBI. This ensures that the diverse range of web-based databases developed over the last two decades by the ADU will remain freely available to users across the world until at least March 2020. The Southern African Bird Atlas Project (SABAP2) and other citizen observer projects provide a wealth of data on the occurrence of species over the southern African sub-region. These data are useful to answer large-scale research questions and to analyse trends in the distribution of species over time and space.

The FIAO has also taken over the management of the South African Bird Ringing scheme (SAFRING), which services bird ringing throughout Africa, providing a key service for research and conservation agencies. SAFRING is led by Dr Robert Thomson and managed by the Niven Librarian, Susan Mvungi, assisted during 2019 by an NRF intern.

CoE members published 54 popular articles and seven chapters in semi-technical books during 2019 (Appendix 2). Regular research activities were posted on the FIAO website, Facebook, Twitter and on Instagram during 2019.

At least 50 public talks and outreach activities were given by CoE members to partner organisations and interested parties, such as the Sasol Birds and Birding Fair, various government and non-governmental organisations, environmental action groups, conservancies, bird clubs and other membership-based societies during 2019.

Print media exposure included regular features in *African Birdlife*, *Wild* magazine, *SANParks Times*, *Safari News* and the *Conversation* (Appendix 2). Print media features in the UK and USA included placements in *The Economist*, *The Daily Mail*, *The Telegraph*, *International Business Times*, *Cosmos Magazine*, *Audubon Magazine* and *Living Bird*. Various radio interviews also were conducted, including on Cape Talk Radio, Radio 702, OFM Radio, two BBC national radio stations (including BBC Radio 4, part of the “Natural Histories” series), German and Canadian national radio, the Hectic Nine-9 live television show for the youth on SABC2, 50/50 on SABC3, as well as the BBC World Series.

CoE staff and students attended and presented their research findings at 17 international and 11 local conferences during 2019 (Table 2).

Table 2. Conferences attended by CoE staff and students during 2019

International Savanna Science Network Meeting (March; Skukuza, KNP, SA) Kyle Middleton
Swartkops Estuary Research Symposium (March; Port Elizabeth, SA) Lorien Pichegru
Grand Challenges for Biodiversity Conservation and Sustainability: The Southern African Experience (April; Porto, Portugal) Martim Melo
Frontiers in Behavioural Research Symposium (April; Max Planck Institute, Germany) Claire Spottiswoode
Marine Litter Monitoring Programme Workshop (WIOMSA/AMWN) (April; Mombasa, Kenya) Lorien Pichegru
EWT Birds of Prey Conference (April; Maun, Botswana) Robert Thomson, Christiaan Brink
Southern Ground Hornbill Working Group (April; Jhb. Zoo, SA) Rob Little
SCOR Floating Litter and its Oceanic Transport Analysis and Modelling workshop (May; Utrecht, Netherlands) Peter Ryan – by Skype
Annual Conference of the Pan-African Association of Zoos and Aquaria (May; Pretoria, SA) Andrew McKechnie
10th Australian Ornithological Conference (July; Darwin, Australia) Andrew McKechnie, Susie Cunningham, Amanda Bourne, Marc Freeman, Nick Pattinson
39th Congress of the Zoological Society of Southern Africa (July; Skukuza, SA) Ryno Kemp, Marc Freeman, Matt Noakes
Hotbirds 10-year Anniversary Workshop (July; Gobabeb, Namibia) Andrew McKechnie, Susie Cunningham, Amanda Bourne, Ben Murphy, Nick Pattinson, Michael Kearney, Miqkayla Stoffberg, Celiwe Ngkamphalala, Shayne Halter, Blair Wolf, Shannon Conradie, Ryno Kemp, Andries Janse van Vuuren, Marc Freeman
12th European Ornithologists’ Union Congress (Aug; Cluj-Napoca, Romania) Arjun Amar, Robert Thomson, Diana Bolopo, Petra Sumasgutner, Chima Nwaogu, Carina Nebel, Miqkayla Stoffberg
International Hen Harrier Meeting (Aug; Groningen, Netherlands) Arjun Amar, Megan Murgatroyd
European Society for Evolutionary Biology (ESEB) (Aug; Turku; Finland) Claire Spottiswoode, Anina Coetzee, Colleen Seymour
10th International Penguin Conference (Aug; Dunedin, New Zealand) Pierre Pistorius, Alistair McInnes, Tegan Carpenter-Kling
UNEP ‘Train the Trainers’ Marine Plastic Monitoring workshop (Aug; Mombasa, Kenya) Peter Ryan
EKZNW Conservation Symposium (Aug; KZN, SA) Arjun Amar
Biodiversity Information Management & Foundational Biodiversity Information Programme (BIMF-FBIP) Forum (Aug; Pretoria, SA) Michael Brooks, Rene Navarro
Extreme Environmental Physiology: Life at the Limits (Sept; Portsmouth, UK) Andrew McKechnie
2nd Marine Litter Monitoring Programme Workshop (WIOMSA/AMWN) (Sept; Port Elizabeth, SA) Lorien Pichegru, Peter Ryan

CLiP CSIR/DST Cefas Marine Plastic Litter workshop (Oct; Cape Town, SA) Lorien Pichegru, Peter Ryan
Southern Ground Hornbill Working Group (Oct; Mabula PGR, SA) Rob Little, Kyle Middleton
10th Oppenheimer De Beers Group Research Conference (Oct; Jhb, SA) Andrew McKechnie, Robert Thomson, Rita Covas, Alistair McInness, Anthony Lowney, Tegan Carpenter-Kling
Kenya Wildlife Services Carnivore Conference (Nov; Nairobi; Kenya) Susan Miller
African Lion Working Group (ALWG) (Nov; Mpala Research Centre; Kenya) Susan Miller
Department of Environment, Forestry and Fisheries Plastic Colloquium (Nov; Johannesburg, SA) Lorien Pichegru, Peter Ryan
TAWIRI Research Conference (Dec; Arusha, Tanzania) David Lloyd-Jones

Honorary Research Associate Dr Martim Melo was the scientific commissioner for the Grand Challenges for Biodiversity Conservation and Sustainability: The Southern African Experience conference held at the Serralves Foundation, Porto, Portugal during April 2019.

During 2019, staff and students of the CoE initiated the process of depositing research data sets, often associated with published scientific papers, into the Main UCT Library data repository system called “ZivaHub”. The system is a facility of the Figshare research data management and dissemination platform which is an online open access repository where researchers can preserve and share their research outputs and offers a <https://doi.org> number as an electronic link to the data set. Natalie Simon from the UCT Research Office published an article ‘Goosing around on golf courses’ on the research based on the dataset titled ‘Goose vigilance and group size on golf courses in Cape Town’ which was included in the 2018-2019 UCT eResearch Report (page 23) to showcase datasets published on ZivaHub to promote the culture of open science at UCT.

Dr Rob Little submitted a CoE research report for inclusion in the UCT Research Council 2019 report on research, which is published for the university Senate Executive Committee (SEC), Senate and Council. Articles about CoE activities also regularly featured in the UCT Science Faculty research newsletter *Science Matters* during 2019 (e.g. Prof. Spottiswoode award page 3, Dr Sumasgutner award page 6, New Niven Librarian page 8 and articles ‘Snobbish birds prefer to live in luxury’ page 13, ‘No touching please! Non-invasive physiological measures in wild animals’ page 15, Vol. 8(1) July 2019) and ‘A predation risk experiment: What makes prey an easy snack for predators?’ page 12 and ‘Uganda birding extravaganza’ page 14, Vol. 8(2) December 2019.

We provided three scientific papers and two popular articles published in 2019 as well as the Hotbirds section of the FIAO 2018 annual report for consideration for the July 2019 NRF research magazine *Science Matters* with the theme ‘harsh realities of climate change’. This material resulted in the two projects on how heat affects behaviour in birds and assessing the impacts of a utility-scale photovoltaic solar energy facility on birds in the Northern Cape being published with the titles ‘Birds of a feather flock together? Not when the furnace is on’ and ‘Nesting on Photovoltaic Solar Energy Infrastructure – A case of the Northern Cape bird species’ – Volume 2, Issue 2, pages 14-15 and 20-21.

Prof. Peter Ryan and the CoE plastics pollution research team attended a Plastic Free Mzansi event on 1 August 2019 at the Ocean Powerboat Club in Granger Bay, Cape Town. The event hosted more than 100 scientists, designers, influencers, retailers and environmental activists who gathered to hear feedback about a month-long campaign that focussed on growing awareness about plastic. In particular, the focus was on chip packets, earbuds and plastic bottles. The event celebrated the achievements of the month and encouraged everyone to continue the journey to using plastic responsibly.

Prof. Peter Ryan and colleagues also published a high impact paper titled 'Rapid increase in Asian bottles in the South Atlantic Ocean indicates major debris inputs from ships' in the *Proceedings of the National Academy of Sciences (PNAS)* which received extensive media attention including by the BBC and *The Economist*.

PhD student Carla du Toit was interviewed live for a presentation about the ecology and conservation of Hadedda Ibises *Bostrychia hagedash* in suburbia on the television news channel eNCA on 30 August 2019.

Research by the Hot Birds Research Project (HBRP) which involves researchers from the CoE, University of Pretoria, SANBI and a host of other local and overseas institutions, and for the last ten years has been researching how Kalahari birds are responding to global heating was featured on Carte Blanche on Sunday 17 November 2019 as part of a story on the effects of climate change on the biodiversity of the Kalahari. Dr Susie Cunningham also conducted an extensive interview on climate change and birds which was broadcast on 'Die Kwik Styg Program 38 Reeks 2' of Radio Sonder Grense on 27 December 2019.

Dr Rob Little participated in a SARChi Chair in Science Communication (SciCOM) workshop on science engagement, including a systematic review of the meanings and strategies associated with terms such as 'science engagement'/'public engagement'/'science communication'/'science outreach' and the most appropriate methods for the monitoring and evaluation of such activities and strategies across different fields and disciplines at the University of Stellenbosch on 28-29 November 2019. He also regularly provided identification of birds and comments on bird behaviour to the general public for queries attracted by the Fitz website.

4. Networking

Objective

Medium- to long-term objectives are to: (1) establish a wide range of key collaborative associations with scientific peers and peer research groups, both locally and abroad; (2) establish partnerships with conservation organisations and NGOs; and (3) establish strong relationships with business organisations with either direct or indirect interests in the fields of conservation biology and ornithology.

Progress

The CoE continued its involvement with networking interactions between institutions directly or loosely collaborating with the CoE (Table 3). Primary collaboration continued with Prof. Andrew McKechnie at the University of Pretoria, Drs Pierre Pistorius and Lorien Pichegru at the Nelson Mandela University, Dr Ben Smit at Rhodes University and with A/Prof. Derek Engelbrecht at the University of Limpopo. New research collaboration is with Dr Chevonne Reynolds at the University of the Witwatersrand. Secondary collaboration will continue with the molecular laboratories of A/Prof. Rauri Bowie at the University of California, Berkeley and Prof. Paulette Bloomer at the University of Pretoria (Table 4).

Close collaborative working relationships with other scientific peers exists both nationally and internationally (Tables 3 & 6). Additional emphasis has been placed on working with historically black universities in South Africa and African universities, e.g. the University of Limpopo, Fort Hare University, Tshwane University of Technology and the Universities of

Zimbabwe and Zambia. The eleven Post-doctoral Fellows supported by the CoE during 2019 came from six different foreign countries.

The First Meeting of the Group of Experts for Marine Litter and Microplastics was held at the CoE during June 2019. This is a United Nations (UN) initiative, in collaboration and cooperation with the Western Indian Ocean Marine Science Association (WIOMSA) and other partners to establish a marine litter regional technical working group in the Western Indian Ocean region. Delegates from Mozambique, Seychelles, Tanzania, Kenya, Reunion and South Africa will provide a forum for the sharing and exchange of information on marine plastics; policy guidance and advice to the Nairobi Convention and other regional frameworks; and synthesize information on the topic from different sources and produce peer-reviewed publications and other products. CoE members attending the workshop were Prof. Peter Ryan (Chairman of the Group for the first year), PhD student Vonica Perold and MSc student Eleonor Weideman.

Prof. Peter Ryan and Dr Pierre Pistorius have significant ongoing collaborative relationships with the South African National Antarctic Programme (SANAP) and are co-investigators on SANAP projects with Dr Azwianewi Makhado (DEA), Dr Maëlle Connan (NMU), and Dr Pete le Roux (U. Pta). Prof. Ryan also has close links to the Royal Society for the Protection of Birds (RSPB) and the British Antarctic Survey mainly through research at Tristan da Cunha and Gough Island.

Dr Lorien Pichegru continues as a member of a Penguin Task Team organized by the Department of Agriculture, Forestry and Fisheries' Pelagic Working Group to address conservation issues relating to fishery closures around African Penguin colonies in Algoa Bay. More recently she has started working with the African Marine Waste Network to tackle marine litter in the Algoa Bay region. Peter Ryan continues his close collaboration with Dr Stefano Aliani and his PhD student Giuseppe Suaria from CNR-ISMAR, the Institute of Marine Sciences in La Spezia, Italy, studying the distribution and abundance of floating plastic items at sea. In 2018, they were successful in securing a research project on the Greenland Circumnavigation Expedition (GLACE), which took place in 2019.

Prof. Claire Spottiswoode maintained her affiliation with co-funding from the University of Cambridge, UK. Her ongoing research work in Zambia has led to a formal MoU between UCT and the Cambridge and Copperbelt Universities, with Dr Lackson Chama as the contact person in Zambia. She also has strong links with the Niassa Carnivore Project in Niassa Province, Mozambique, for her ongoing research on honeyguide-human interactions. She is investigating the mechanistic basis of egg coloration in honeyguides in collaboration with physicist Dr Silvia Vignolini from Cambridge. Her research on the maintenance of evolutionary processes in plant-animal interactions is done in collaboration with Dr Colleen Seymour at SANBI, Dr Rebecca Karanja from Jomo Kenyatta University, Kenya, and Silvia Vignolini. Claire continues to collaborate closely with evolutionary geneticist Prof. Michael Sorenson at Boston University, USA, and has current collaborations with Dr Mary Caswell Stoddard (Princeton University, USA), Prof. Mark Hauber (University of Illinois, USA), Dr Steve Portugal (Royall Holloway, University of London, UK), Dr David Labonte (Imperial College, University of London, UK) and Dr Violaine Llaurens (Muséum national d'Histoire naturelle, Paris, France).

A/Prof. Arjun Amar collaborated regularly with Prof. Steve Redpath from the University of Aberdeen, Scotland, regarding research into human-wildlife conflict and related issues. In collaboration with Dr Christopher Briggs in the United States, Arjun's raptor research team are using MORPHIC which they developed during 2016 to describe the distribution of

morphs of Swainson's Hawks *Buteo swainsoni* across North America. In another collaboration led by Dr Chiara Morosinotto, University of Turku, including the research group of Prof. Jon Brommer and Dr Patrik Karell in Finland, Dr Rui Lourenço in Portugal and Priv-Doc Anita Gamauf in Austria, Arjun's team are using MORPHIC to describe the distribution of Tawny Owl *Strix aluco* morphs across Europe in relation to climate, habitat, anthropogenic impact and diet. Within the scope of the STINT-NRF bi-lateral research project, Arjun's team held a joint workshop before the European Ornithologists' Union conference during August 2017 at the University Turku, Finland. Main collaborators at the workshop from Lund University were Drs Caroline Isaksson, Arne Hegemann, Hannah Watson and Johan Nilsson. Additional collaborations were continued with Dr Anita Gamauf from the National History Museum Vienna, Austria, and Dr Erkki Korpimäki from Turku University, Finland.

A/Prof. Arjun Amar and Post-doc Megan Murgatroyd continued to collaborate with Dr Andrew Jenkins of Avisense Consulting to GPS tag Verreaux's Eagles *Aquila verreauxii* at a wind farm development site in the Karoo. In partnership with the Avisense field team, six Verreaux's Eagles have been equipped with high-resolution GPS tags from the University of Amsterdam Bird Tracking System yielding fine-scale tracking data. These data are being used to build a collision risk model for the species, which will be invaluable for informing Environmental Impact Assessments for future proposed wind farm sites. Dr Murgatroyd applied this collision risk model for Verreaux's Eagles to a wind development site at Victoria West and three potential wind farm sites (working with Avisense consulting and Mainstream Renewables), which assisted the development planning and the technique was made available nationally in 2018. In a related project, Peter Ryan worked with Robin Colyn, Sam Ralston and Hanneline Smit-Robinson from BirdLife South Africa to measure flight heights of displaying Red Larks, a localized, vulnerable species potentially at risk from wind farm developments. This study was made possible thanks to a generous donation from Mainstream Renewables.

A/Prof. Arjun Amar, Dr Susie Cunningham and Post-doc Petra Sumasgutner organized a STINT-NRF urban ecology project workshop at De Hoop Nature Reserve during October 2018, which was attended by nine CoE staff and students and seven staff and students from Lund University, Sweden. The key objectives were to update all attendees on recent progress relating directly to the project and to other relevant studies; encourage and facilitate interactions between project teams, including sharing of knowledge and experience; plan the final stages of the STINT-NRF project, including the laboratory work and field experiments; finalise a review/perspective paper and work towards delivering that goal; gain experience from participation in an international workshop, and to decide on the scope for future collaboration after the closing of the current STINT-NRF project in February 2020.

Dr Robert Thomson collaborates with Dr Jukka Forsman from the University of Oulu, Finland and Dr Tomas Grimm from Palacky University, Czech Republic, investigating front-line defences in host-brood parasite systems using Common Cuckoo *Cuculus canorus* parasitism of cavity nesting Common Redstarts *Phoenicurus phoenicurus*. He also works with Dr Andrea Santangeli from the University of Helsinki, Finland, to reconcile farmers with vulture conservation in southern Africa. This project forms a broad collaboration of NGOs in southern Africa involved with vulture conservation: VulPro, EWT, BildLife SA, Vultures Namibia and Raptors Botswana.

Dr Susie Cunningham is leading a research team investigating the comparative anatomy of ibis bill-tip organs using histological and micro-CT scanning techniques to understand

bill-tip organ morphology and the structure of bill-tip organ mechanoreceptors. Collaborators on this project are Dr Isabel Castro (Massey University, New Zealand), A/Prof. Jeremy Corfield (Salisbury University, New Zealand), Prof. Anusuya Chinsamy-Turan (BioSci UCT) and Morea Petersen (HUB histology lab, Groote Schuur campus UCT). She has also been approached by Dr Steve Portugal (Royal Holloway – University of London) and Dr Alex Bond (RSPB) for a collaboration to understand bill-tip structure in petrels and albatrosses.

The collaboration between Prof. Andrew McKechnie and Dr Blair Wolf, University of New Mexico (UNM), has secured a significant grant from the US National Science Foundation for joint research which started in 2015 between the FIAO CoE and UNM focussing on the 'Hot Birds' project. Prof. McKechnie's new MSc student, Mpho Malematja, has developed a project in collaboration with Prof. Bill Karasov (University of Wisconsin, USA) that will explore digestive flexibility in White-browed Sparrow-weavers *Plocepasser mahali*.

Dr Martha Nelson-Flower, a former Post-doc at the FIAO CoE, now associated with the University of British Columbia, Canada, continued her collaboration on Southern Pied Babbler *Turdoides bicolor* research with A/Prof. Mandy Ridley at the University of Western Australia looking at aspects of dispersal, kin selection and nepotism.

A MoU remained active for 2019 between the Mabula Ground-Hornbill Project (MGHP) and the FIAO CoE. Dr Rob Little is Vice-Chairman of the MGHP Advisory Board and continued to contribute to the activities of the national Southern Ground-Hornbill Working Group.

Dr Rob Little and PhD student Kyle Middleton participated in developing a Biodiversity Management Plan (BMP) for the Southern Ground-Hornbill *Bucorvus leadbeateri* with the Department of Environmental Affairs (DEA), relevant provincial conservation agencies and other stakeholders which will be implemented in collaboration with the DEA and SANBI.

Prominent research and conservation partners who visited the CoE during 2019

Dr Alan Lee, Editor-in-Chief *Ostrich: Journal of African Ornithology* visited the CoE and gave a presentation titled 'Two years in the Karoo: What did I do?' on 21 February 2019.

Sascha Dueker from the Department of Conservation Biology, Georg-August-Universität Göttingen, Germany visited the CoE and gave a presentation titled 'Distance sampling and conservation in two African parrot species: the African Grey Parrot *Psittacus erithacus* and the Seychelles Black Parrot *Coracopsis barklyi* on 26 February 2019.

Prof. Steven Chown from the School of Biological Sciences, Monash University, Australia and President of the Scientific Committee on Antarctic Research, Cambridge, United Kingdom visited the CoE and gave a talk titled 'Choosing our Future: Antarctic Science in a Global Setting' on 8 March 2019.

Kari Gunson graduated from the Conservation Biology MSc programme at the Fitz in the 1990s and now mitigates wildlife-road conflict in North America. She visited the CoE and presented a talk titled 'The emergence of road ecology and solutions for mitigating impacts on wildlife' on 20 March 2019.

Christie Craig a PhD candidate at the Endangered Wildlife Trust and collaborator with the Fitz CoE visited the CoE and gave a talk titled 'How safe is the Blue Crane stronghold?' on 24 April 2019.

A/Prof. Michael Collins from Rhodes College, Tennessee USA, visited the CoE and gave a presentation titled 'Regional assembly of avian malaria parasites in South American birds' on 6 May 2019.

Anna Robuck, a National Oceanic and Atmospheric Administration Nancy Foster Scholar PhD candidate at the University of Rhode Island, USA, and a member of the Gulf of Maine, Stellwagen Bank National Marine Sanctuary (SBNMS) team, visited the CoE and presented a talk titled 'Great Shearwaters in the Gulf of Maine: ongoing research by Stellwagen Bank National Marine Sanctuary' on 23 May 2019.

Claire Spottiswood's PhD student, Tanmay Dixit, from the University of Cambridge visited the CoE and gave a talk on his research in Zambia titled 'Signature and forgeries: how can a host fight back against parasitic mimics?' on 25 June 2019.

Dr Dylan Childs from the University of Sheffield visited the CoE and presented a talk titled 'Using Integral Project Models (IPMs) to address questions in ecology and evolution' such as understanding the causes and consequences of individual trait variation on 17 September 2019.

Dr Frauke Fischer from the University of Wurzburg, Germany, visited the CoE and presented a talk titled 'Conservation, Chocolate, CEOs – how to bring it all together' on 30 October 2019.

Dr Stratton Hatfield from the Wageningen University visited the CoE and gave a talk titled 'The Mara Raptor Project: Raptor research and conservation in Kenya's Massai Mara ecosystem' on 12 November 2019.

Table 3. Collaborators involved with the CoE

Title	Name	Country	Institution	Gender	Race
South Africa					
Prof.	Res Altwegg	SA	UCT	M	W
Ms	Andrea Angel	SA	BirdLife SA	F	W
Dr	Mark Brown	SA	NVT/UKZN	M	W
Dr	Maëlle Connan	SA	NMU	F	W
Dr	Dave Glassom	SA	UKZN	M	W
Prof.	Raymond Jansen	SA	Tshwane U Tech	M	W
Dr	Lucy Kemp	SA	MGHP	F	W
Dr	Ian Little	SA	EWT	M	W
Dr	Amanda Lombard	SA	NMU	F	W
Dr	Guy Midgley	SA	U Stellenbosch	M	W
Dr	Chevonne Reynolds	SA	WITS	F	W
Dr	Colleen Seymour	SA	SANBI	F	B
Dr	Hanneline Smit-Robinson	SA	BirdLife SA	F	W
Dr	Andrew Tucker	SA	CS Vet Consultancy	M	W
Dr	Ross Wanless	SA	BirdLife SA	M	W
Ms	Kerri Wolter	SA	VulPro	F	W
Africa					
Dr	Colleen Begg	Mozambique	Niassa Carnivores	F	W
Dr	Jackson Chama	Zambia	Copperbelt U	M	B
Dr	Christine Dranzoa	Uganda	Makerere U	F	B
Dr	Rebecca Karanja	Kenya	Jomo Kenyatta U	F	W

Prof.	Cwbisile Magagula	Swaziland	U Swaziland	F	B
Mr	Innocent Magunje	Zimbabwe	BirdLife Zimbabwe	M	B
Mr	Fadzai Matsvimbo	Zimbabwe	BirdLife Zimbabwe	F	B
Prof.	Ara Monadjem	Swaziland	U Swaziland	M	W
Asia, Australia & New Zealand					
Prof.	Jeremy Corfield	New Zealand	Salisbury U	F	W
Prof.	Isabel Castro	New Zealand	Massey U	F	W
Dr	Janet Gardner	Australia	Australian National U	F	W
Prof.	Michael Kearney	Australia	U Melbourne	M	W
Dr	Nicola Mitchell	Australia	U Western Australia	F	W
Prof.	Bruce Robertson	New Zealand	Otago	M	W
Prof.	Hideshige Takada	Japan	Tokyo Agric U	M	W
Dr	Alan Tennyson	New Zealand	Te Papa	M	W
Europe & UK					
Dr	Stefano Aliani	Italy	CNR-ISMAR	M	W
Dr	Per Alstrom	Sweden	Uppsala U	M	W
Dr	Beatriz Arroyo	Spain	IREC, Ciudad Real	F	W
Prof.	Andrew Balmford	UK	U Cambridge	M	W
Dr	Alex Bond	UK	RSPB	M	W
Dr	Marta Cuellar Cerda	Spain	CreSa U Barcelona	F	W
Dr	Richard Cuthbert	UK	Wildlands Trust	M	W
Dr	Dan Chamberlain	Italy	U Turin	M	W
Dr	Claire Doutrelant	France	CNRS Montpellier	F	W
Prof.	Nicholas Davies	UK	Cambridge	M	W
Dr	Gareth Dyke	Ireland	UC Dublin	M	W
Prof.	Jon Fjeldsa	Denmark	U Copenhagen	M	W
Dr	Jukka Forsman	Finland	U Oulu	M	W
Dr	Jérôme Fuchs	France	Natural History Mus.	M	W
Dr	Anita Gamauf	Austria	Nat Hist Mus. Vienna	F	W
Dr	David Grémillet	France	CNRS Montpellier	M	W
Dr	Michael Griesser	Switzerland	U Zurich	M	W
Dr	Tomas Grimm	Czech Rep.	Palacky U	M	W
Dr	Jacob Gonzalez-Solis	Spain	U Barcelona	M	W
Dr	Steffen Hahn	Switzerland	Swiss Ornith. Inst.	M	W
Dr	Bengt Hansson	Sweden	Lund U	M	W
Prof.	Ben Hatchwell	UK	U Sheffield	M	W
Dr	Arne Hegemann	Sweden	Lund U	M	W
Dr	Nicholas Horrocks	UK	U Cambridge	M	W
Dr	Hugo Mathe Hubert	Switzerland	EAWAG Zurich	M	W
Dr	Caroline Isaksson	Sweden	Lund U	F	W
Dr	Gabriel Jamie	UK	U Cambridge	F	B
Dr	Felix Liechti	Switzerland	Swiss Ornith. I Inst	M	W
Dr	Anoushka Kinahan	Ireland	Frankfurt Zoo Soc	F	W
Dr	Erkki Korpimäki	Finland	Turku U	M	W
Prof.	Luc Lens	Belgium	U Ghent	M	W
Dr	Violaine Llaurens	France	Mus. d'Histoire Nat.	F	W
Dr	Rowan Martin	UK	World Parrot Trust	M	W
Dr	Chiara Morosinotto	Finland	U Turku	F	W
Dr	Francois Mougeot	Spain	IREC, Ciudad Real	M	W
Dr	Johan Nilsson	Sweden	Lund U.	M	W
Dr	Veli-Matti Pakanen	Finland	U Oulu	M	W
Dr	Mathieu Paquet	UK	U Edinburg	M	W
Dr	Richard Phillips	UK	Br Antarctic Survey	M	W
Dr	Steve Portugal	UK	Royal Holloway	M	W
Prof.	Petra Quillfeldt	Germany	U Giessen	F	W
Prof.	Andy Radford	UK	U Bristol	M	W
Dr	Nichola Raihani	UK	IOZ, London	F	W
Prof.	Steve Redpath	UK	Aberdeen U	M	W
Dr	Angela Ribiero	Denmark	U Copenhagen	F	W
Dr	Yan Ropert-Coudert	France	CNRS Chize	M	W
Dr	Andrea Santangeli	Finland	U Helsinki	M	W
Dr	Marjorie Sorenson	UK	U Cambridge	F	W
Dr	Martin Stevens	UK	U Exeter	M	W

Prof.	Cedric Suer	France	U Strasberg	M	W
Dr	Jakub Szymkowiak	Poland	Adam Mickiewicz U	M	W
Dr	Alex Thornton	UK	U Exeter	M	W
Dr	Rose Thorogood	Finland	U Helsinki	F	W
Dr	Rene van Dijk	UK	U Sheffield	F	W
Dr	Silvia Vignolini	UK	U Cambridge	F	W
Dr	Henri Weimerskirch	France	CNRS Chize	M	W
Dr	Stephen Willis	UK	Durham	M	W
Dr	Hannah Watson	Sweden	Lund U.	F	W
Prof.	Rory Wilson	UK	Swansea U	M	W
USA & Canada					
Prof.	Mark Brigham	Canada	U Regina	M	W
Dr	Theresa Burg	Canada	U Lethbridge	F	W
Dr	Tom Flower	Canada	Simon Fraser U	M	W
Dr	Alex Gerson	USA	U Massachussetts	M	W
Dr	Robert Hackett	USA	Chicago Mus	F	W
Prof.	Bill Karasov	USA	U Wisconsin	M	W
Prof.	Martinez del Rio	USA	U Wyoming	M	W
Dr	Mark Mainwaring	USA	U Montana	M	W
Dr	Martha Nelson-Flower	Canada	U British Columbia	F	W
Prof.	Michael Sorenson	USA	Boston U	M	W
Dr	Mary Stoddard	USA	Princeton U	F	W
Prof.	Gary Voelker	USA	Texas A&M U	M	W
Dr	Blair Wolf	USA	U New Mexico	M	W
Dr	Brian Wood	USA	U California	M	W

5. Service rendering

Objective

A medium- to long-term objective is to establish formal contact with a range of conservation agencies and relevant government bodies, such as the Department of Environmental Affairs (DEA) and the Department of Agriculture, Forestry & Fisheries (DAFF), to ensure the expertise of the CoE is used to address practical research and information needs. CoE members will continue to render their services to the broader scientific community and the general public.

Progress

Links continued to be serviced with a diversity of conservation agencies, NGOs, government departments and industry partners. These include the DEA, DAFF, the South African National Biodiversity Institute (SANBI), SANParks, IUCN, Conservation International, Fauna & Flora International, the Royal Society for the Protection of Birds (RSPB), BirdLife South Africa & Zimbabwe, the World Parrot Trust, the Endangered Wildlife Trust, the Namibian Ministry of the Environment, the Wildlife Conservation Society, the Nature Conservation Corporation and the South African Deep Sea Trawling Industry Association. Peter Ryan was the invited speaker at the BirdLife SA AGM during April 2019.

CoE members served on the editorial boards of 31 scientific journals, and as members of 90 relevant membership and advisory fora. They also served the broader scientific community by participating on scientific steering committees and working groups, and by reviewing project proposals for science funding agencies and 101 papers for 56 peer-reviewed international and local journals during 2019 (Appendix 1).

Members of the CoE continued to offer technical advice on biodiversity conservation measures to a wide range of governmental departments, conservation implementing agencies and other industry players (e.g. Plastics SA and the South African wind energy sector). This advice is offered directly to policy makers in para-statal (SANBI, SANParks, CapeNature, Ezemvelo KwaZulu-Natal Wildlife) and government departments (e.g. drafting NEMBA regulations and permitting guidelines for the DEA, contributing to fishery management working groups for the DAFF, reviewing best-practice guidelines for managing the wind and solar energy industry for DEA, etc.). Service rendering is not confined to South Africa with inputs being given to neighbouring countries including the UK (for Tristan da Cunha and Gough Island), international agreements (e.g. CCAMLR, CMS, ACAP and RFMOs), as well as collaboration with the Namibian Ministry of the Environment, the Botswana Department of Wildlife and National Parks, and the Marine Stewardship Council for regional fisheries. The CoE also works with partner NGOs such as the BirdLife network (including BirdLife Botswana, South Africa, Zimbabwe), Conservation International, the Endangered Wildlife Trust (EWT), Fauna & Flora International, the IUCN, Nature Conservation Corporation, the Royal Society for the Protection of Birds, the World Conservation Society (WCS) and the World Parrot Trust to effect changes in the biodiversity conservation arena and related industries.

Prof. Peter Ryan is on the editorial boards of *Bird Conservation International* and *Antarctic Science*. He is the South African representative on ACAP's Taxonomy Working Group, a member of the IMAF Working Group of CCAMLR, the South Atlantic Island Plant Specialist Group, the UN's GESAMP Working Group 40, and is a core member of the SCOR Working Group on Floating Marine Debris (Flotsam). Prof. Ryan was an invited speaker at PlasticsSA annual general meeting in Johannesburg during November 2019. He also participated at the SCOR Floating Litter and its Oceanic Transport Analysis and Modelling workshop in Utrecht, Netherlands, during May 2019 and at the UNEP 'Train the Trainers' Marine Plastic Monitoring workshop in Mombasa, Kenya during August 2019.

Prof. Andrew McKechnie served on the ethics and scientific committees of the National Zoological Gardens and chaired the ethics committee of BirdLife South Africa. Peter Ryan and Andrew McKechnie are also scientific advisors for the BirdLife SA magazine *African Birdlife*.

Dr Lorien Pichegru is a member of the Coega Environmental Monitoring Committee. She facilitates public talks about local and international environmental issues (such as municipal development including climate change, river flows and pollution, shark ecology and the shark cage diving debate, rehabilitation of marine wildlife, and combating plastic pollution in Port Elizabeth), fund raises for marine education initiatives, such as Marine Week in Port Elizabeth, and co-ordinates environmental projects, such as beach clean-ups, alien clearing, setting waste recycling plans for the squid fishing industry and implementing a waste management plan for the Nelson Mandela University Sustainability Forum. She is also active on WIOMSA/AMWN marine activities and participated in two WIOMSA/AMWN workshops in Port Elizabeth and Mombasa, Kenya during 2019.

Ongoing research by Lorien and her team on the foraging behaviour of African Penguins *Spheniscus demersus* in Algoa Bay since 2008 and during the experimental purse-seine fishing exclusion has shown the impact of the competition with industrial fisheries on seabirds for the first time and the benefit of closing small areas to fishing. The results are used by the Island Closure Task Team of the Small Pelagic Scientific Working Group, from the Department of Agriculture, Forestry and Fisheries, to assess the use of fishing exclusion around penguin colonies to increase penguin numbers. South African National

Parks henceforth extended the Greater Addo Marine Protected Area in Algoa Bay to include the foraging habitat of African Penguins around St Croix Island, the world largest African Penguin colony.

Following his research on a novel and inexpensive method to quantify relative fish abundance using recreational fish-finders for his PhD, post-doc Alistair McInnes designed and analysed small pelagic fish surveys in Plettenberg Bay to assess the suitability of pelagic habitat for an artificial African Penguin breeding colony. The study commissioned by BirdLife South Africa was to establish if this site is suitable for breeding African Penguins. Alistair is also working to develop a real-time index of small pelagic fish abundance, as perceived by African Penguins, to better help manage the highly variable fishery for small pelagic fish such as sardines and anchovies. Dr McInnes left the CoE during 2019 to manage BirdLife SA's seabird programme.

Dr Martim Melo coordinates the Biodiversity TwinLab between CIBIO (Research Center in Biodiversity and Genetic Resources, University of Porto, Portugal) and the Zoological Museum and Herbarium of Lubango (Angola). This initiative will establish a network of TwinLabs in South Africa, Namibia, Zimbabwe and Mozambique. The goal is capacity building in biodiversity conservation in the Portuguese speaking countries particularly Angolan TwinLab, since that country has a stark contrast between the rich biodiversity and the threats it faces, and the almost absence of a researchers, technicians and managers. Most of the capacity building is based on research projects with integrated MSc and PhD students. The intention is that within 10-15 years, English will no longer be an obstacle and the Portuguese-speaking countries will be more integrated at the international level. Dr Melo also contributes to capacity building of members of a conservation NGO in São Tomé and Príncipe that supports the implementation of the BirdLife International and BirdLife Africa action plans for threatened species in those countries.

PhD student Selena Flores facilitated training of the SANParks Coast Care team on how to be aware while cleaning up beaches in shorebird breeding areas, including spotting incubating adult shorebirds, nests, and behavioural indicators that chicks or nests are nearby. From results of her PhD research on White-fronted Plover *Charadrius marginatus* responses to disturbance, in conjunction with research supervisor Dr Mark Brown and other coastal bird research with the Nature's Valley Trust, beaches in the Plettenberg Bay region have been re-zoned with regards to dog access. Initial recommendation maps were requested by the Bitou Municipality, with implementation of new regulations including new and additional signage, enforcement logistics and a social media campaign.

Post-doc Susan Miller contributed a chapter on "Reintroduction, reinforcement and genetic remedy of lion populations" to *Guidelines for the Conservation of Lions in Africa* (GCLA), compiled by IUCN/SSC Cat Specialist Group who were commissioned by the CITES and CMS Secretariats to develop the guidelines. The final document was presented at the CITES CoP18 in Colombo, Sri Lanka in May 2019.

Rob Little reviewed an application on the conservation of the Udzungwa Forest Partridge *Xenoperdix udzungwensis* from the Sokoine University of Agriculture, Tanzania for the Zoological Society of London EDGE of existence Fellowship programme in July 2019.

PhD student Jesslina Suri is the Chairman of the UCT Birding Club; four other CoE students are committee members and a further 15 CoE staff and students are members, all playing a significant role in supporting the club.

HUMAN RESOURCES

Mrs Janine Dunlop started as the Niven Librarian on 11 March 2019, following the resignation of Susan Mvungi at the end of 2018 (Table 5).

The following people worked within or were students at the CoE during 2019.

Table 4. Core FitzPatrick Institute CoE team members for 2019

Title	Name	Citizen	Institution	Gender	Race	% time in CoE
Dr	Jaqueline Bishop	SA	UCT	F	W	10
Prof.	Paulette Bloomer	SA	U Pretoria	F	W	10
Dr	Susan Cunningham	NZ	UCT	F	W	100
Dr	Lorien Pichegru	France	NMU	F	W	50
Dr	Chevonne Reynolds	SA	WITS	F	W	20
Prof.	Claire Spottiswoode	SA	UCT/U Cambridge	F	W	66
A/Prof.	Arjun Amar	UK	UCT	M	W	100
A/Prof.	Rauri Bowie	SA	U Cal. Berkeley	M	W	10
A/Prof.	Derek Engelbrecht	SA	U Limpopo	M	W	10
Prof.	Andrew McKechnie	SA	U Pretoria	M	W	30
Dr	Pierre Pistorius	SA	NMU	M	W	40
Prof.	Peter Ryan	SA	UCT	M	W	100
Dr	Ben Smit	SA	NMU	M	W	20
Dr	Robert Thomson	SA	UCT	M	W	100

Table 5. Administrative and support staff at the CoE for 2019

Title	Name	Position	Gender	Race
Ms	Janine Dunlop	Niven Librarian	F	W
Ms	Anthea Links	SAP Administrator	F	B
Ms*	Phelisa Hans	Library Assistant	F	B
Ms*	Carmen Smith	CoE Senior Secretary	F	B
Ms	Hilary Buchanan	Admin Assistant	F	W
Mr	Gonzalo Aguilar	Principal Technical Officer	M	W
Dr*	Rob Little	CoE Manager	M	W

* CoE funded

Table 6. Honorary Professors and Research Associates for 2019

Title	Name	Citizen	Institution	Gender	Race	% time in CoE
Prof.	Phoebe Barnard *	UK	U Washington	F	W	10
Dr	Rita Covas *	Portugal	CEFE-CNRS	F	W	60
Dr	Claire Doutrelant	France	CEFE-CNRS	F	W	30
Dr	Genevieve Jones	SA	BirdLife SA	F	W	10
Dr	Kristi Maciejewski *	SA	OTS	F	W	20
Dr	Colleen Seymour	SA	SANBI	F	W	10
Prof.	Sue Milton	SA	Renu Karoo	F	W	10
Dr	Jessica Shaw	UK	Scottish Natural Heritage	F	W	10
Dr	Antje Steinfurth	Germany	RSPB U Cambridge	F	W	50
Dr	Jane Turpie	SA	Anchor Consulting	F	W	10
A/Prof.	Mandy Ridley *	New Zealand	U Western Australia	F	W	50
Dr	Lizanne Roxburgh	SA	EWT	F	W	10
Ms	Jessie Walton	SA	Freelance	F	W	10
Dr	Azwianewi Makhado *	SA	Marine & Coastal Mgnt	M	B	10
Dr	Steve Boyes	SA	Wild Bird Trust	M	W	30
Dr	Callan Cohen	SA	Birding Africa	M	W	20
Dr	Tim Cook	France	Diderot Education, France	M	W	10
Prof.	Graeme Cumming *	SA	James Cook U, Australia	M	W	10
Prof.	David Cumming *	Zimbabwe	U Zimbabwe	M	W	20
Dr	Richard Dean	SA	Renu Karoo	M	W	10
Dr	Tom Flower *	UK	U St Andrews, Canada	M	W	20
Dr	David Grémillet *	France	CNRS	M	W	20
Dr	Andrew Jenkins	SA	Avisense	M	W	20
Dr	Grant Joseph	SA	Freelance	M	W	10
Dr	Alan Lee	SA	Blue Hill Nature Reserve	M	W	10
Dr	Ian Little	SA	EWT	M	W	20
Dr	Rowan Martin	UK	World Parrot Trust	M	W	10
Dr	Yan Rupert-Coudert	France	French Polar Institute IPEV	M	W	20
Dr	Martim de Melo	Portugal	CIBIO	M	W	10
Dr	Antoni Milewski	Australia	Murdoch U, Australia	M	W	20
Mr	Michael Mills	SA	Angola Country Program	M	W	20
Prof.	Stephen Redpath *	UK	U Aberdeen	M	W	10
Dr	Richard Sherley	UK	U Exeter	M	W	10
Dr	Rob Simmons *	UK	UCT	M	W	40
Dr	Ross Wanless *	SA	BirdLife SA	M	W	30

* Official UCT Honorary Professor, Honorary Research Associate or Honorary Research Affiliate

Table 7. FitzPatrick Institute CoE Post-doctoral Fellows for 2019

Title	Name	Citizen	Gender	Race	NRF CoE support	
					Bursary	Running
Dr	Diana Bolopo	Spain	F	W	Yes	Yes
Dr	Anina Coetsee	SA	F	W	No	Yes
Dr	Megan Murgatroyd **	UK	F	W	Yes	Yes
Dr	Susan Miller	SA	F	W	No	No
Dr	Petra Sumasgutner ***	Austria	F	W	Yes	Yes
Dr	Jessica van der Wal	Dutch	F	W	Yes	No
Dr	Pietro D'Amelio	Italy	M	W	No	No
Dr	Ben Dilley	SA	M	W	Yes	No
Dr	Dayo Osinubi *	Nigeria	M	B	Yes	Yes
Dr	Alistair McInnes ***	SA	M	W	No	Yes
Dr	Chima Nwaogu	Nigeria	M	B	Yes	Yes

*January–February 2019; **January–June 2019; ***January–July 2019

Table 8. FIAO CoE postgraduate students registered for, or graduating in, 2019

* = thesis students and ** = MSc CB course students who graduated during 2019

Name	Citizen	Univ.	Gender	Race	Degree	1 st year	NRF CoE support	
							Bursary	Running
Moreras, Angela	Colombia	UCT	F	B-H	PhD	2019	Yes	Yes
Suri, Jesslina	SA	UCT	F	B-I	PhD	2018	No	Yes
Bourne, Amanda	SA	UCT	F	W	PhD	2016	Yes	Yes
Carpenter-Kling, Tegan	SA	NMU	F	W	PhD	2017	Yes	Yes
du Toit, Carla (upgrade)	SA	UCT	F	W	PhD	2017	No	Yes
Flores, Selena (upgrade)	USA	UCT	F	W	PhD	2015	Yes	No
Nebel, Carina	Austria	UCT	F	W	PhD	2017	Yes	Yes
Perold, Vonica	SA	UCT	F	W	PhD	2019	Yes	Yes
Stevens, Kim (upgrade)	SA	UCT	F	W	PhD	2016	Yes	No
Traisnel, Gwendoline *	France	NMU	F	W	PhD	2016	No	No
Adekola, Emmanuel	Nigeria	UCT	M	B	PhD	2018	No	Yes
Aikins, Timothy	Ghana	UCT	M	B	PhD	2019	Yes	Yes
Olubodun, Olufemi	Nigeria	UCT	M	B	PhD	2019	Yes	Yes
Brink, Christiaan	SA	UCT	M	W	PhD	2017	Yes	Yes
Cloete, Daniel	SA	UCT	M	W	PhD	2016	No	No
Dilley, Ben *	SA	UCT	M	W	PhD	2015	No	No
Freeman, Marc	SA	U. Pta	M	W	PhD	2019	Yes	Yes
Kemp, Ryno (upgrade)	SA	U. Pta	M	W	PhD	2017	Yes	Yes
Lowney, Anthony	UK	UCT	M	W	PhD	2015	Yes	Yes
McClellan, Luke (upgrade)	UK	UCT	M	W	PhD	2016	Yes	Yes
Middleton, Kyle (upgrade)	SA	UCT	M	W	PhD	2017	Yes	Yes
Murphy, Benjamin	German	UCT	M	W	PhD	2018	Yes	Yes
Noakes, Matthew	SA	U. Pta	M	W	PhD	2015	Yes	No
Pattinson, Nicholas	SA	UCT	M	W	PhD	2018	Yes	Yes
Rodseth, Edmund (upgrade)	SA	UCT	M	W	PhD	2015	No	No
Schoombie, Stefan	SA	UCT	M	W	PhD	2017	Yes	Yes
Brink, Rene	SA	UCT	F	B-C	MSc CB	2019	No	No
Malematja, Sekgwari *	SA	U. Pta	F	B	MSc	2017	Yes	No
Moloto, Ditiro *	SA	UCT	F	B	MSc	2016	No	No
Ncube, Thinabakho **	SA	UCT	F	B	MSc CB	2018	No	No
Ramudzuli, Abigail	SA	UCT	F	B	MSc	2018	Yes	Yes
Rukuni, Praxedes	Zimbabwe	NMU	F	B	MSc	2019	Yes	Yes
Stofberg, Miqkayla	SA	UCT	F	B-C	MSc	2018	Yes	Yes
Surajnarayan, Sheroma	SA	UCT	F	B-I	MSc	2019	No	No
Cerilla, Cecilia	USA	UCT	F	W	MSc CB	2019	No	No
Currin, Catherine	SA	NMU	F	W	MSc	2018	Yes	Yes
du Plessis, Monique	SA	UCT	F	W	MSc	2019	No	Yes
Engelbrecht, Ilana	SA	NMU	F	W	MSc	2017	Yes	No
Gardner, Kathryn	SA	UCT	F	W	MSc CB	2019	No	No
Gedert, Jennifer	USA	UCT	F	W	MSc CB	2019	No	No
Grey, Kerry-Anne **	SA	UCT	F	W	MSc CB	2018	No	No
Hoffenberg, Amy **	SA	UCT	F	W	MSc CB	2018	No	No
Hörbst, Sandra **	Austria	UCT	F	W	MSc CB	2018	No	No
Johnson, Laurie *	SA	UCT	F	W	MSc	2016	No	No
Kirves, Samantha	German	UCT	F	W	MSc	2019	No	No
Lund, Jess	SA	UCT	F	W	MSc	2019	Yes	Yes
Muller, Rebecca **	SA	UCT	F	W	MSc CB	2018	No	Yes
Roberts, Jessica	Namibia	U. Pta	F	W	MSc	2019	Yes	Yes
Schroeder, Michelle **	USA	UCT	F	W	MSc CB	2018	No	No
Sheridan, Kate	UK	UCT	F	W	MSc CB	2019	No	No
Stanbridge, Debbie	SA	UCT	F	W	MSc CB	2019	No	No
Steyn, Clara **	SA	UCT	F	W	MSc CB	2018	No	No
van der Merwe, Rona	SA	UCT	F	W	MSc	2017	No	No
Venter, Olivia **	SA	UCT	F	W	MSc CB	2018	No	No
Weideman, Eleanor	SA	UCT	F	W	MSc	2018	No	Yes
Mabaso, Xolani **	SA	UCT	M	B	MSc CB	2018	No	No
Montrond, Gilson	Cape Verde	UCT	M	B	MSc CB	2019	No	No
Osborne, Alexis	SA	UCT	M	B-C	MSc	2017	No	No
Padayachee, Kailen	SA	UCT	M	B-I	MSc	2019	Yes	Yes
Siggala, Makabongwe	SA	NMU	M	B	MSc	2017	Yes	No
Singh, Geethen	SA	WITS	M	B-I	MSc	2019	Yes	Yes

Colyn, Robin	SA	UCT	M	W	MSc	2019	Yes	No
Eastment, Conor	SA	UCT	M	W	MSc CB	2019	No	No
Fleming, Campbell	SA	UCT	M	W	MSc	2016	No	No
Harper, Jack	UK	UCT	M	W	MSc CB	2019	No	No
Lloyd-Jones, David	New Zeal.	UCT	M	W	MSc	2019	No	No
Orolowitz, Matthew	SA	UCT	M	W	MSc CB	2019	No	No
van der Merwe, Daryl **	SA	UCT	M	W	MSc CB	2018	No	No
Weiss, Joshua **	SA	UCT	M	W	MSc CB	2018	No	No
Wilson, Luke	Zimbabwe	UCT	M	W	MSc CB	2019	No	No
Banda, Shamiso	Zimbabwe	NMU	F	B	BSc H	2019	Yes	Yes

Table 9. CoE Post-doctoral Fellow and student demographics in 2019

	Black			White			Total
	Female	Male	Total	Female	Male	Total	
Post-doc		2	2	6	3	9	11
PhD	2	3	5	8	13	20	26
MSc	6	4	10	9	3	12	22
MSc CB 2018	1	1	2	7	2	9	11
MSc CB 2019	1	1	2	5	4	9	11
BSC Hons	1		1				1
Total	11	11	22	35	25	59	82

Table 10. Proportion of 'Black' students supported by the CoE during 2005-2019

	Year (2000s)														
	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19
Number students	52	53	54	45	45	50	59	60	68	73	68	71	72	63	71
Black students	15	11	13	13	18	15	15	11	8	7	8	13	14	15	20
Proportion Black (%)	29	21	24	29	40	30	25	18	12	10	12	18	19	24	28

Table 11: Places of origin of CoE students supported in 2019

NRF Targets	Number students supported	%
SA	48	67
SADC*	4	6
African	4	6
Other	15	21
Total	71	100

*Southern African Development Community countries excluding South Africa (= Angola, Botswana, Congo (DRC), Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, Swaziland, Tanzania, Zambia and Zimbabwe)

Table 12. Research assistants for 2019

Title	Name	Citizenship	Gender	Race	Based at
Ms	Jess Bernt	SA	F	W	UCT
Ms	Doreen Chaussadas	France	F	W	UCT
Mrs	Christie Craig	SA	F	W	UCT
Ms	Kim Daniels	SA	F	B-C	UCT
Dr	Dorianne Elliot	SA	F	W	UP
Ms	Paige Ezzey	SA	F	W	UCT
Ms	Carrie Hickman	UK	F	W	UCT
Ms	YiTing Ho	SA	F	B-A	UCT
Dr	Caroline Grace Howes	USA	F	W	Wits
Dr	Sally Hofmeyr	SA	F	W	UCT
Ms	Kim Hunt	SA	F	W	UCT
Ms	Leigh Kelly	SA	F	W	UCT
Ms	Femke Kiggen	Netherlands	F	W	NMU
Ms	Samantha Kirves	Germany	F	W	UCT
Ms	Billi Krochuk	Canada	F	W	UCT
Ms	Rita Leal	Portugal	F	W	UCT
Ms	Kerry Leigh-Moss	SA	F	W	NMU
Ms	Lesedi Moagi	SA	F	B	UCT
Dr	Nola Parsons	SA	F	W	SANCCOB
Ms	Natasha Pindral	SA	F	W	UCT
Ms	Kumreshni Pillay	SA	F	B-I	UCT
Dr	Margaux Rat	French	F	W	UCT
Ms	Katharina Reusch	German	F	W	NMU
Ms	Sanjo Rose	SA	F	W	UCT
Ms	Michelle Schroeder	USA	F	W	UCT
Ms	Vhuawelo Simba	SA	F	B	UCT
Ms	Jessleena Suri	India	F	B-I	UCT
Ms	Terriann Thavar	SA	F	B	UCT
Mr	Cameron Blair	SA	M	W	UCT
Mr	Rafael Bloch	SA	M	W	UCT
Mr	Rion Cuthill	SA	M	W	UCT
Mr	Silky Hamama	Zambia	M	B	UCT
Mr	Cheslyn Hickley	SA	M	B-C	UCT
Mr	Leungo Leepile	Botswana	M	B	UCT
Dr	Shane McPherson	New Zealand	M	W	UCT
Mr	Burghen Siebert	SA	M	W	UCT
Mr	Serge Monezero	DRC	M	B	UCT
Mr	Clement Motau	SA	M	B	UCT
Mr	Collins Moya	Zambia	M	B	UCT
Mr	Andrew Murray	SA	M	W	UCT
Mr	Sylvester Mukonko	Zambia	M	B	UCT
Mr	Adrien Pajot	France	M	W	UCT
Mr	Kervin Prayag	Mauritius	M	B-I	UCT
Mr	Joshua Strauss	SA	M	W	UCT
Mr	Nicolas Suarez	Argentina	M	W	NMU
Mr	Zingfa Wala	Nigeria	M	B	UCT
Mr	Kyle Walker	SA	M	W	UCT

FINANCES

The proportion of DST-NRF grant and co-funds and the distribution of funding across the two focal research areas during 2019

Table 13 reflects the total funding (R21 938 213) for the 27 CoE projects during 2019, according to the approved and amended 2019 CoE budget and leveraged funds sourced elsewhere (Table 15). Table 14 reflects the overall distribution of funds across the two focal research areas during 2019. Research conducted by the CoE which is not funded at least in part by the CoE and UCT remuneration of FIAO CoE staff are excluded from Tables 13 & 14.

Table 13. Distribution of 2019 research funds according to the source of funds

	DST-NRF grant		Leveraged funds	
	Bursary	Running	Bursary	Running
	3 406 620	3 221 700	6 477 000	8 832 893
	51%	49%	42%	58%
Sub total		6 628 320*		15 309 893
Proportion		30%		70%

*the corporate operating funds reflected in the 2019 CoE budget are excluded from the DST-NRF grant

Table 14. Distribution of 2019 research funds according to the fund source and the focal research areas: 1 = understanding biodiversity; 2 = maintaining biodiversity

Fund source	Research area	1	2	Proportion
DST-NRF	1	1 798 750		8%
	2		4 829 570	22%
Leveraged funds	1	4 436 000		20%
	2		10 873 893	50%
Total		6 234 750	15 703 463	
Proportion within research area		28%	72%	100%

Comments on the distribution of CoE and other funds during 2019:

The DST-NRF research grant was a little less than one third of the total funds available for the CoE research projects. The proportional distribution of research area funding strongly favours conservation science (maintaining biodiversity), thus satisfying the recommendations of the 2009 review panel.

Table 15. Funds leveraged from other sources for 2019 CoE projects

Bursaries		Running costs		Total	
1*	2	1	2		
		230 000		230 000	Local Public R3 879 000
	150 000		49 000	199 000	NRF STINT Swedish bilateral
		310 000	550 000	860 000	NRF Unrated Researchers
	90 000			90 000	NRF SARChI McKechnie
	200 000		100 000	300 000	NRF Innovation S&D scholarship
			600 000	600 000	NRF Thuthuka
	120 000			120 000	NRF SANAP/DEA
	120 000	1 300 000	60 000	1 480 000	NRF ACCESS
					SANBI
					Local Private R3 735 580
			300 000	300 000	ABAX Foundation
			150 000	150 000	APNR donations
	95 000			95 000	Charl van der Merwe Trust
200 000		50 000		250 000	Clancey bequest
275 000	46 000			321 000	Claude Leon Foundation
	300 000		200 000	500 000	Endangered Wildlife Trust
			140 000	140 000	Hans Hoheisen Charitable Trust
			55 580	55 580	Jock Safari Lodge
			6 000	6 000	Klaserie Game Reserve
			300 000	300 000	Mainstream Renewables
			250 000	250 000	Mary Oppenheimer & Daughters
	120 000		8 000	128 000	Oppenheimer Memorial Trust
	225 000		375 000	600 000	NMU Research Theme Grant
120 000		15 000		135 000	UCT CoE Paleosciences
			415 000	415 000	UCT URC CoE grant
			60 000	60 000	UCT Travel Grants
	30 000			30 000	URC WITS
					International Public R3 386 000
	663 000		493 000	1 156 000	European Research Council
		1 360 000		1 360 000	ANR (France)
		714 000		714 000	IF (FCT, Portugal)
			156 000	156 000	Natural England
					International Private R4 309 313
			150 000	150 000	ACE Foundation
			25 000	25 000	AZA -SAFE
			1 664 000	1 664 000	BLSA-National Geographic Society
585 000		180 000		765 000	BBSRC Fellowship, Cambridge
			153 913	153 913	MBZ Species Conservation Fund
	395 000	65 000		460 000	National Geographic Society
			18 400	18 400	Raptor Research Foundation
342 000		21 000		363 000	Commonwealth Trust, U. Cambridge
		170 000		170 000	Harvard University
360 000		180 000		540 000	Univ. Western Australia
1 882 000	2 554 000	4 595 000	6 278 893	15 309 893	

*1 = understanding biodiversity; 2 = maintaining biodiversity

DST-NRF CoE
Birds as Keys to Biodiversity Conservation at the FitzPatrick Institute
CASH FLOW ANALYSIS FOR THE 2019 FINANCIAL YEAR

DESCRIPTION	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	TOTAL	Annual Budget	VARIANCE
NRF			3 580 950					3 580 950					7 161 900	7 161 900	0
Interest	1 828												1 828	1 828	0
Other (incl. c/f from 2018)	516 025												516 025	516 025	0
TOTAL INCOME	517 853	0	3 580 950	0	0	0	0	3 580 950	0	0	0	0	7 679 753	7 679 753	0
Salaries	-100 941	-80 417	-97 749	-125 170	-116 064	-115 898	-149 322	-148 998	-144 178	-154 453	-163 875	-157 435	-1 554 501	1 560 480	5 979
Student costs	-673 500	-1 286 085	-485 620	-100 000	-179 000	-661 435	-64 225	-50 000	-100 000	-7 000	-76 905		-3 683 770	4 119 250	435 480
Conferences (incl. Travel)		-3 526	-22 237		-27 649	-300	-50 699	-4 823	-46 491				-155 724	382 000	226 276
Equipment													0	0	0
Running	-7 310	-209 231	-178 331	-182 316	-152 031	-259 184	-199 819	-241 254	-94 683	-251 622	-197 377	-208 587	-2 181 747	2 514 600	332 853
TOTAL EXPENSES	-781 751	-1 579 258	-783 937	-407 486	-474 745	-1 036 818	-464 065	-445 075	-385 352	-413 075	-438 157	-366 022	-7 575 741	8 576 330	1 000 589
NET OUTCOME PROFIT/LOSS	-263 899	-1 843 157	953 856	546 370	71 625	-965 193	-1 429 258	1 706 617	1 321 266	908 190	470 033	104 011	104 011		

Notes:

- 1 Balance brought forward matches previous year's Financial Statement
- 2 Shows actual expenditure only (excluding commitments) for all months
- 3 Reflects the entire costs of the CoE including satellite campuses
- 4 Regards income as positive cash flow and expenditure as negative cash flow

Audited Income and expenditure for 2019

A copy of the 2019 Income and Expenditure Statements shown below in Table 16 is attached to the *Ernst & Young* 2019 CoE Audit Report.

The audit pack was submitted to the UCT Finance Office on 23 January 2020. Relatively few queries were raised during the audit process and the report was clean with regards to compliance, apart from minor issues related to expenses for Research Assistants which cannot be identified before the start of the year and thus are not listed by name in the business plan, and that the field research season spans calendar years which meant that some expenses cannot be neatly split for each year. Generally, those queries listed were of little material significance and were clarified to the auditor's satisfaction.

However, the final Ernst & Young 2019 audit report had been delayed beyond the point where it could be included in the SC meeting documents. This was further exacerbated by the provision of the statement that "the final version will be sent subject to our receipt of the minutes of the upcoming SC meeting" from the auditors.

Table 16. FIAO CoE Financial Statement for January to December 2019

	Operating Fund	Invested Fund	All Funds
Brought forward from 2018	-516 024.64	-25 850.57	-541 875.21
Income	-7 161 899.00	-1 962.19	-7 163 861.19
NRF income	-7 161 899.00		
Other income			
Investment income		-1 962.19	
Net transfer value	0.00	-0.00	-
CR transfer	-0.00	-0.00	
DR transfer	0.00		
Expenditure	7 444 073.53		
Salaries total	1 554 500.82		
Bursaries	3 764 895.00		
Conferences	196 881.24		
Equipment			
Running costs	1 927 796.47		
Carry forward to 2020	-233 850.11	-27 812.76	-261 662.87
Reconciliation:			
SAP balance @ 31/12/2019	-73 903.74		
Advances in hand	-159 946.37		
	-233 850.11		

Notes:

- 1) No non-specific transfers to other collaborators were made in 2019.
- 2) All funds carried forward to 2020 include advances in hand.
- 3) Both funds reconcile to SAP.

Appendix 1: Positions on Editorial Boards, Councils, Advisory/Steering Committees and papers reviewed during 2019

Editorial Boards

- *Acta Ethologica* (Associate Editor; Covas)
- *African Journal of Ecology* (International Review Panel; Barnard)
- *African Journal of Marine Science* (Editorial Advisory Board; Pistorius)
- *African Journal of Wildlife Research* (Associate Editor; Cumming, Miller)
- *Animal Conservation* (Associate Editor; Barnard)
- *Antarctic Science* (Associate Editor; Ryan)
- *Behavioral Ecology* (Editor; Ridley)
- *Biodiversity Observations* (Editor; Navarro; Associate Editor; Thomson)
- *Biology Letters* (Associate Editors; Cunningham, Spottiswoode)
- *Bird Conservation International* (Associate Editor; Ryan)
- *BMC Climate Change Responses* (Associate Editor; Barnard, McKechnie)
- *BMC Evolutionary Biology* (Editorial Board; Bowie)
- *Bothalia: African Biodiversity & Conservation* (Co-editor; Coetzee)
- *Diversity and Distributions* (Associate Editor; Cumming)
- *Ecology & Society* (Associate Editor; Cumming)
- *Environmental Research Communications* (Editorial Board; Ryan)
- *Emu – Austral Ornithology* (Associate Editor; McKechnie)
- *Frontiers in Ecology and Evolution* (Associate Editor; Covas, Subject Editor; Ridley)
- *Frontiers in Marine Science* (Review editor; Pichegru, Pistorius)
- *Ibis* (Editor; Bowie, Associate Editor; Amar, Sumasgutner, Wanless)
- *International Scholarly Research Notices ISRN Ecology* (Editor; Ridley)
- *International Scholarly Research Notices ISRN Zoology* (Associate Editor; Pistorius)
- *Journal of Comparative Physiology B* (Editorial Board; McKechnie)
- *Landscape Ecology* (Editorial Board; Cumming)
- *National Geographic News Watch* (Contributing Editor; Boyes)
- *Marine and Freshwater Behaviour and Physiology* (Associate Editor; Pistorius)
- *Oecologia* (Associate Editor; Thomson)
- *Ornis Fennica* (Associate Editor; Thomson)
- *Ostrich* (Editor-in-Chief; Lee; Associate Editor; Jones, Little, Osinubi, Reynolds, Ridley; Guest Editor; Reynolds; Book Review Editor; Dunlop)
- *Peer J* (Editorial Board; Ridley)
- *Philosophical Transactions of the Royal Society B* (Guest Editor; Spottiswoode)

Membership & Advisory services

- ACAP Taxonomy Working Group (Ryan)
- African-Eurasian Migratory Landbirds Working Group (Osinubi)
- *Africa Geographic* (Director; Boyes)
- African Biosphere Reserves Project Advisory Committee (Member Osinubi)
- *African Birdlife* (Scientific Advisors; McKechnie, Ryan)
- African Penguin Population Reinforcement Working Group (Pichegru, Pistorius)
- African Penguin Habitat Working Group (Pichegru)
- African Seabird Group (Cook, Pistorius, Pichegru, Ryan, Steinfurth, Wanless)
- African Marine Waste Network (Advisory Panel; Pichegru, Ryan)

- American Ornithological Society (Bowie, Cunningham, du Toit, McKechnie, Melo, Sumasgutner)
- American Ornithologists' Union (du Toit, van der Wal)
- Association for the Study of Animal Behaviour (Bolopo, Covas, Flower, van der Wal)
- Association for Tropical Biology & Conservation (Lee)
- Bayworld Museum Board of Trustees (Pistorius)
- BirdLife Portugal (Board member; Melo)
- BirdLife South Africa Conservation Advisory Committee (Members; Ryan, Thomson)
- BirdLife South Africa Ethics Committee (McKechnie)
- British Ecological Society (Boyes, Johnson, Flores, Flower, Moloto, Nelson-Flower, Ridley, Sumasgutner, van der Wal)
- British Ornithologists' Union (Council; Amar, Bowie; Members; Cunningham, Melo, Spottiswoode, Sumasgutner)
- Bunkering Environmental Working Group (Pichegru)
- Bunkering Stakeholder Committee (Pichegru)
- Cambridge Philosophical Society (Ridley)
- Coastal and Marine Research Institute Committee (Pichegru, Pistorius)
- Coega Environmental Monitoring Committee (Pichegru)
- Earthworks (Co-Chair: Flower)
- Eastern Cape Forest Management and Research Committee (Boyes)
- Ecological Society of America (Cunningham)
- Endangered Wildlife Trust Birds of Prey Programme Advisory Committee (Amar)
- Escape to the Wild (Patron; Little)
- European Ornithologists Union (Council Member: Sumasgutner; Members: Amar, Bolopo, Brink, Murgatroyd, Thomson)
- European Society of Evolutionary Biology (Covas, Melo)
- Expert Group on Birds and Marine Mammals of the Scientific Committee for Antarctic Research (Cook, Ryan)
- Fellow of Magdalene College, Cambridge (Spottiswoode)
- Forest & Bird Society (Cunningham)
- Galapagos Conservation Trust (Ambassador; Steinfurth)
- German Ornithologists' Society (Member; Sumasgutner)
- International Bio-logging Society (Cook, Pistorius)
- International Ornithological Congress (Committee member; Lee)
- International Ornithology Council Taxonomy Advisory Committee (Bowie, Ryan)
- International Ornithologists' Union (du Toit)
- International Parrot Research Group (Africa Coordinators; Boyes, Martin)
- International Society for Behavioural Ecology ISBE (Executive Council; Ridley, Spottiswoode; Members: Covas, Flower, Nelson-Flower, van der Wal)
- IUCN Red List of Threatened Species (Cook, Pichegru)
- IUCN SSC Galliform Specialist Group (Little)
- IUCN SSC Hornbill Specialist Group (McKechnie)
- Lion Management Forum of South Africa (Trustee; Miller)
- Mabula Ground-Hornbill Project Advisory Board (Vice Chairman; Little)
- Migrant Landbird Study Group (Osinubi)
- National Geographic Society (Boyes)
- Nelson Mandela University Animal Research Ethics Committee (Pistorius)
- Nelson Mandela Bay Maritime Cluster (Pichegru)
- Nelson Mandela University Sustainability Forum (Pichegru)

- Pan-African Ornithological Congress Committee (Amar, Lee, Osinubi)
- Portuguese Society of Evolutionary Biology (Board member; Melo)
- Prince Edward Islands (Advisory Committee; Ryan)
- Raptor Research Foundation (Amar, Sumasgutner)
- Raptors Botswana Scientific Steering Committee (Amar)
- Red Data Book Revision Steering Group (Amar, Wanless)
- Resilience Alliance (Cumming)
- SANBI Research Ethics & Scientific Committee (McKechnie)
- Southern African Bird Ringing unit (SAFRING) (Coordinator; Thomson)
- SCOR working group on monitoring plastics at sea (Core member; Ryan)
- Seabird Scientific Working Group – DEA (Pichegru, Pistorius)
- Society for Conservation Biology (Barnard, Cumming, Melo, Pichegru)
- Society for Integrative and Comparative Biology (McKechnie)
- Society for Systematic Biology (Bowie)
- Society for the Study of Evolution (Bowie, Melo)
- South African Association of Botanists (Coetzee)
- South African Biosystematics Initiative Steering Committee (Bloomer)
- South African Bird Atlas Project 2 (SABAP@) Steering Committee (Chair; Ryan; Members; Brooks, Lee, Reynolds, Thomson)
- South African Network for Coastal and Oceanic Research (SANCOR) (Steering Committee; Pistorius)
- South African Young Academy of Science (Founder member; McKechnie)
- Southern African Bird List Committee (Bowie, Ryan)
- Southern African Society for Systematic Biology (President; Bloomer)
- Southern African Wildlife Management Association (Carstens, Little, Maciejewski, Miller)
- Southern Ground-Hornbill Working Group (Little, Middleton)
- Sustainable Seas Trust (Chairperson Algoa Bay Hope Spot committee; Pichegru)
- Tristan's Biodiversity Advisory Group (Ryan, Wanless)
- UCT Birding Club (Chairman; Suri; Members; 19 staff & students)
- UN Environmental Assembly Expert Group on Marine Litter and Microplastics (Ryan)
- UN GESAMP Working Group 40 on monitoring plastics (Ryan)
- Wild Bird Trust (Trustees; Boyes, Little)
- Wild Bird Trust British Columbia (Flower)
- Wildlife and Environment Society of South Africa (Vice Chair Algoa Bay branch; Pichegru)
- WI-IUCN SSC Cormorant Specialist Group (Cook)
- Wilson Ornithological Society (Member; Bolopo, van der Wal)
- WIOMSA Group of Experts on Marine Plastics (Chairman; Ryan)
- World Parrot Trust (Africa Director; Boyes)
- World Seabird Union (Africa representatives; Pichegru, Wanless; Member; Cook)
- Zoological Society of Southern Africa (Members; Cunningham, du Toit, Little, Lee, McKechnie, Pistorius, Sumasgutner)

Manuscripts reviewed for scientific journals during 2019

Acta Ethologica (1 Covas)

African Journal of Ecology (1 Reynolds)

African Journal of Wildlife Research (1 Miller)

African Zoology (1 Lee)

Animal Behaviour (1 Bolopo, 1 Flower, 1 Ridley)
Animal Cognition (1 Ridley)
Animal Conservation (1 Melo)
Aquatic Conservation: Marine and Freshwater Ecosystems (1 Ryan)
Behavioural Ecology (1 Cunningham)
Behavioural Ecology and Sociobiology (1 Ridley)
Birdlife Conservation International (1 Lee)
Bird Study (1 Lee)
Biological Conservation (1 Ryan)
Biology Letters (2 McKechnie, 1 Ridley)
Botanical Journal of Linnean Society (1 Coetzee)
Canadian Journal of Zoology (1 McKechnie)
Climate Change (1 McKechnie)
Condor (1 Melo)
Conservation Science and Practice (1 Miller)
Current Biology (1 Ryan)
Diversity (1 Ryan)
Ecology Letters (1 McKechnie)
Ecological Applications (1 Ryan)
Environment International (1 Perold, 1 Ryan)
Environmental Pollution (2 Ryan)
Ethology (1 Ridley)
European Journal of Wildlife Research (1 Miller)
Evolution Letters (1 Spottiswoode)
Forest Ecosystems (1 Little, 1 Lee)
Frontiers in Ecology and Evolution (1 Covas, 3 Ridley)
Functional Ecology (3 McKechnie)
ICES Journal of Marine Science (1 Cook)
Journal of Animal Ecology (1 Covas, 2 Ridley)
Journal of Arid Environments (2 Cunningham)
Journal of Avian Biology (1 McKechnie, 1 Ryan)
Journal of Comparative Physiology B (1 McKechnie)
Journal of Zoology, London (2 McKechnie)
Landscape Ecology (1 Reynolds)
Malimbus (1 Melo)
Mammalia (1 Miller)
Marine Biology (1 Pistorius)
Marine Ecology Progress Series (1 Pichegru, 1 Pistorius, 1 Ryan)
Marine Pollution Bulletin (4 Ryan)
Molecular Biology Reports (1 Miller)
Molecular Ecology (1 Melo)
Nature Ecology & Evolution (1 Ryan, 1 Spottiswoode)
Notornis (1 Ryan)
Ostrich (1 Cook, 1 Crowe, 2 Little, 2 Lee, 1 McKechnie, 2 Osinubi, 3 Reynolds)
Polar Biology (1 Pistorius, 1 Ryan)
Proceedings of the National Academy of Sciences (PNAS) (1 Ryan)
Proceedings of the Royal Irish Academy (1 Ryan)
Proceedings of the Royal Society B (5 Covas, 2 Cunningham, 1 McKechnie, 2 Ridley)
Science of the Total Environment (1 Ryan)
Scientific Reports (1 Pichegru, 1 Ryan)
Scopus (1 Miller)
South African Journal of Science (1 McKechnie)

Appendix 2: FitzPatrick Institute CoE publications for 2019

Scientific papers published (155)

Papers in SCI-ranked journals (143)

IF score = Thomson Scientific Impact Factor score (2017, 2-year impact factor)

Published hard-copy journals (69):

Aizen, M.A., Aguiar, S., Biesmeijer, J.C., Garibaldi, L.A., Inouye, D.W., Jung, C., Martins, D.J., Medel, R., Morales, C.L., Ngo, H., Pauw, A., Paxton, R.J., Sáez, A. and **Seymour, C.L.** 2019. Global agricultural productivity is threatened by increasing pollinator dependence without a parallel increase in crop diversification. *Global Change Biology* 25: 3516–3527 <https://doi.org/10.1111/gcb.14736> IF: 8.880

Amar, A., Reynolds, C., Van Velden, J. and Briggs, C.W. 2019. Clinal variation in morph frequency in Swainson's hawk across North America: no support for Gloger's ecogeographical rule. *Biological Journal of the Linnean Society* 127(2): 299–309 <https://doi.org/10.1093/biolinnean/blz037> IF 2.203

Atkins, A., Little, R.M., Redpath, S.M. and **Amar, A.** 2019. Impact of increased predation risk on vigilance behaviour in a gregarious waterfowl, the Egyptian goose *Alopochen aegyptiaca*. *Journal of Avian Biology* 50(6): e02121 <https://doi.org/10.1111/jav.02121> IF: 2.232

Bester, M.N. and **Ryan, P.G.** 2019. Early pupping of a sub-Antarctic fur seal at Inaccessible Island, Tristan da Cunha. *Polar Biology*. 42:1221–1224. <https://doi.org/10.1007/s00300-019-02510-7> IF: 2.002

Bester, M.N. and **Ryan, P.G.** 2019. Stalked barnacles on an adult male sub-Antarctic fur seal at Inaccessible Island, Tristan da Cunha. *Polar Biology* 42:1943–1946. <https://doi.org/10.1007/s00300-019-02560-x> IF: 2.002

Bourne, A.R., McKechnie, A.E., Cunningham, S.J., Ridley, A.R., Woodborne, S.M. and Karasov, W.H. 2019. Non-invasive measurement of metabolic rates in wild, free-living birds using doubly labelled water. *Functional Ecology* 33(1): 162-174. <https://doi.org/10.1111/1365-2435.13230> IF: 5.037

Campbell, K., **Steinfurth, A.,** Underhill, L., Coetzee, J., Dyer, B., Ludynia, K., **Makhado, A.,** Merkle, D., Rademan, J., Upfold, L. and Sherley, R., 2019. Local forage fish abundance influences foraging effort and offspring condition in an endangered marine predator. *Journal of Applied Ecology*. 56:1751–1760 <https://doi.org/10.1111/1365-2664.13409> IF: 5.782

Caravaggi, A., Cuthbert, R.J., **Ryan, P.G.,** Cooper, J. and Bond, A.L., 2019. The impacts of introduced House Mice on the breeding success of nesting seabirds on Gough Island. *Ibis* 161: 648-661. [doi: 10.1111/ibi.12664](https://doi.org/10.1111/ibi.12664) IF: 1.994

Carstens, K.F., Kassanje, R., **Little, R.M., Ryan, P.G.** and **Hockey, P.A.R.** 2019. Breeding success and population growth of Southern Ground Hornbills *Bucorvus leadbeateri* in an area supplemented with nest-boxes. *Bird Conservation International* 29(4) 627-643. <https://doi.org/10.1017/S0959270919000108> IF: 1.725

Carstens, K.F., Kassanje, R., **Little, R.M., Ryan, P.G.** and **Hockey, P.A.R.** 2019. The effects of weather, group size and type of nest on the timing of egg-laying in the Southern Ground-hornbill

Bucorvus leadbeateri. *Journal of Ornithology* 160(3): 633-640. <https://doi.org/10.1007/s10336-019-01654-x> IF: 1.954

Carstens, K.F., Kassanje, R., **Little, R.M.**, **Ryan, P.G.**, and **Hockey, P.A.R.** 2019. Natal dispersal in the Southern Ground Hornbill *Bucorvus leadbeateri*. *Ostrich* 90(2): 119-127. <https://doi.org/10.2989/00306525.2019.1590474> IF: 0.443

Cerda-Cuéllar, M., Moré, E., Ayats, T., Aguilera, M., Muñoz-González, S., Antilles, N., **Ryan, P.G.** and González-Solís, J. 2019. Do humans spread zoonotic enteric bacteria in Antarctica? *Science of the Total Environment* 654: 190-196. <https://doi.org/10.1016/j.scitotenv.2018.10.272> IF: 5.589

Chaisi, M.E., **Osinubi, S.T.**, Dalton, D.L. and Suleman, E., 2019. Occurrence and diversity of avian haemosporidia in Afrotropical landbirds. *International Journal for Parasitology: Parasites and Wildlife* 8: 36-44. IF: 2.075

Chamberlain, D.E., Henry, D.A., **Reynolds, C.**, Caprio, E. and **Amar, A.** 2019. The relationship between wealth and biodiversity: A test of the Luxury Effect on bird species richness in the developing world. *Global Change Biology* 25:3045–3055. <https://doi.org/10.1111/gcb.14682> IF: 8.880

Clairbaux, M., Fort, J., Mathewson, P., Porter, W., Strøm, H. and **Gremillet, D.** 2019. Climate change could overturn bird migration: transarctic flights and high-latitude residency in a sea ice free Arctic. *Scientific Reports* 9: 17767. <https://doi.org/10.1038/s41598-019-54228-5> IF: 4.011

Cole, T.L., Ksepka, D.T., Mitchell, K.J., Tennyson, A.J., Thomas, D.B., Pan, H., Zhang, G., Rawlence, N.J., Wood, J.R., Bover, P., Bouzat, J.L., Cooper, A., Fiddaman, R., Hart, T., Miller, G., **Ryan, P.G.**, Shepherd, L.D., Wilmshurst, J.M. and Waters, J.M. 2019. Mitogenomes uncover extinct penguin taxa and reveal island formation as a key driver of speciation. *Molecular Biology and Evolution* 36 (4): 784–797. <https://doi.org/10.1093/molbev/msz017>. IF: 14.797

Connan, M., **Dilley, B.J.**, **Whitehead, T.O.**, **Davies, D.**, McQuaid, C.D. and **Ryan, P.G.** 2019. Multidimensional stable isotope analysis illuminates resource partitioning in a sub-Antarctic island bird community. *Ecography* 42: 1948–1959. <https://doi.org/10.1111/ecog.04560> IF: 5.946

Conradie, S.R., Woodborne, S.M., **Cunningham, S.J.** and **McKechnie, A.E.** 2019. Chronic, sublethal effects of high temperatures will cause severe declines in southern African arid-zone birds during the 21st century. *Proceedings of the National Academy of Sciences of the United States of America (PNAS)* 116(28): 14065–14070. <https://doi.org/10.1073/pnas.1821312116> IF: 9.580

Crawford, R. J. M., Sydeman, W. J., Thompson, S. A., Sherley, R. B. and **Makhado, A. B.** 2019. Food habits of an endangered seabird indicate recent poor forage fish availability off western South Africa. *ICES Journal of Marine Science* 76(5): 1344–1352. [doi:10.1093/icesjms/fsz081](https://doi.org/10.1093/icesjms/fsz081) IF: 3.367

Crowe, T.M., **Little, R.M.** and Turner, D.A. 2019. Clarifying taxonomic, distributional and genetic information relating to subspecies of the Hildebrandt's Spurfowl *Pternistis hildebrandti* and the Yellow-necked Spurfowl *P. leucoscepus*. *Ostrich* 90(3): 279–280. <https://doi.org/10.2989/00306525.2019.1660431> IF: 0.443

Cumming, G.S. and Henry, D.A., 2019. Point counts outperform line transects when sampling birds along routes in South African protected areas. *African Zoology* 54(4): 187-198. <https://doi.org/10.1080/15627020.2019.1658540> IF: 0.962

- de Kock, C. and **Lee, A.T.K.** 2019. Agulhas long-billed lark (*Certhilauda brevirostris*) densities, population estimates and habitat association in a transformed landscape. *African Zoology* 54(3): 161–168. <https://doi.org/10.1080/15627020.2019.1629339> IF: **0.962**
- Dilley, B.J., Davies, D., Stevens, K., Schoombie, S.,** Schoombie, J. and **Ryan, P.G.** 2019. Burrow wars and sinister behaviour among burrow-nesting petrels at sub-Antarctic Marion Island. *Ardea* 107(1): 97-102. <https://doi.org/10.5253/arde.v107i1.a5> IF: **1.125**
- Dilley, B.J.,** Hedding, D.W., Henry, D.A., Rexer-Huber, K., Parker, G.C., **Schoombie, S., Osborne, A.** and **Ryan, P.G.,** 2019. Clustered or dispersed: testing the effect of sampling strategy to census burrow-nesting petrels with varied distributions at sub-Antarctic Marion Island. *Antarctic Science* 31(5): 231-242. <https://doi.org/10.1017/S0954102019000300> IF: **1.653**
- Dilley, B.J., Davies, D.,** Mitham, A., Glass, T., Repetto, J., Swain, G. and **Ryan, P.G.** 2019. Population estimates of burrow-nesting petrels breeding at the Nightingale Island group, Tristan da Cunha Archipelago. *Marine Ornithology* 47: 267-275. IF: **0.537**
- Hyvärinen, O.,** Hoffman, T.M. and **Reynolds, C.,** 2019. Vegetation dynamics in the face of a major land-use change: a 30-year case study from semi-arid South Africa. *African Journal of Range & Forage Science*, 36(3): 141-150. <https://doi.org/10.2989/10220119.2019.1627582> IF: **1.173**
- Jeal, C., Perold, V., Seymour, C.L.,** Ralston-Paton, S. and **Ryan, P.G.** 2019. Utility-scale solar energy facilities – Effects on invertebrates in an arid environment. *Journal of Arid Environments* 168: 1-8. <https://doi.org/10.1016/j.jaridenv.2019.05.008> IF: **1.825**
- Jeal, C., Perold, V.,** Ralston-Paton, S. and **Ryan, P.G.** 2019. Impacts of a concentrated solar power trough facility on birds and other wildlife in South Africa. *Ostrich* 90(2): 129-137. <https://doi.org/10.2989/00306525.2019.1581296> IF: **0.443**
- Jepsen, E.M., Ganswindt, A., Ngcamphalala, C.A., **Bourne, A.R., Ridley, A.R.** and **McKechnie, A.E.** Non-invasive monitoring of physiological stress in an afrotropical arid-zone passerine bird, the southern pied babbler. *General and Comparative Endocrinology* 276: 60-68. <https://doi.org/10.1016/j.ygcen.2019.03.002> IF: **2.445**
- Jones, C.W., Risi, M.M.,** Cleeland, J. and **Ryan, P.G.** 2019. First evidence of mouse attacks on adult albatrosses and petrels breeding on sub-Antarctic Marion and Gough Islands. *Polar Biology* 42(3): 619-623. <https://doi.org/10.1007/s00300-018-02444-6> IF: **2.002**
- Kappes, P.J., Bond, A.L., Russell, J.C. and **Wanless, R.M.** 2019. Diagnosing and responding to causes of failure to eradicate invasive rodents. *Biological Invasions* 21: 2247–2254. <https://doi.org/10.1007/s10530-019-01976-0> IF: **2.897**
- Kemp, R.** and **McKechnie, A.E.,** 2019. Thermal physiology of a range-restricted desert lark. *Journal of Comparative Physiology B* 189(1): 131-141. <https://doi.org/10.1007/s00360-018-1190-1> IF: **2.341**
- Le Bot, T., Lescroël, A., Fort, J., Péron, C., Gimenez, O., Provost, P. and **Grémillet, D.,** 2019. Fishery discards do not compensate natural prey shortage in Northern gannets from the English Channel. *Biological Conservation* 236: 375-384. <https://doi.org/10.1016/j.biocon.2019.05.040> IF: **4.451**
- Lee, A.T.K.,** Geary, C., Wright, D.R. and **Dean, W.R.J.** 2019. Vulnerability of birds to contaminated water sources in the Karoo region of South Africa. *Ostrich* 90(4): 397–405. <https://doi.org/10.2989/00306525.2019.1638846> IF: **0.443**

- Lee, A.T.,** Reeves, B. and Wright, D.R. 2019. Hottentot Buttonquail *Turnix hottentottus*: Endangered or just overlooked?. *Bird Conservation International* 29(1): 136-143. <https://doi.org/10.1017/S0959270918000059>. IF: 1.725
- Little, R.M. and Navarro, R.A.** 2019. Implications of geographical range changes and resultant sympatry for three *Accipiter* hawks on the Cape Peninsula, South Africa. *Ostrich* 90(2): 139-142. <https://doi.org/10.2989/00306525.2019.1613270>. IF: 0.443
- Loiseau, C., **Melo, M.**, Lee, Y., Pereira, H., Hanemaaijer, M.J., Lanzaro, G.C. and Cornel, A.J. 2019. High endemism of mosquitoes on São Tomé and Príncipe Islands: evaluating the general dynamic model in a worldwide island comparison. *Insect Conservation and Diversity* 12(1): 69-79. <https://doi.org/10.1111/icad.12308> IF: 2.313
- McEvoy, O.K., **Miller, S.M.**, Beets, W., Bodasing, T., Borrego, N., Burger, A., Courtenay, B., Ferreira, S., Hanekom, C., Hofmeyr, M., Packer, C., Robertson, D., Stratford, K., Slotow, R. and Parker, D.M. 2019. The use of contraceptive techniques in managed wild African lion (*Panthera leo*) populations to mimic open system cub recruitment. *Wildlife Research* 46(5): 398-408. <https://doi.org/10.1071/WR18079>. IF: 1.244
- McInnes, A.M., Ryan, P.G.,** Lacerda, M. and **Pichegru, L.** 2019. Targeted prey fields determine foraging effort thresholds of a marine diver: important cues for the sustainable management of fisheries. *Journal of Applied Ecology* 56:2206–2215 <https://doi.org/10.1111/1365-2664.13462> IF: 5.782.
- Mandiwana-Neudani, T.G., Little, R.M., Crowe, T.M. and Bowie, R.C.K.** 2019. Taxonomy, phylogeny and biogeography of African spurfowls Galliformes, Phasianidae, Phasianinae, Coturnicini: *Pternistis* spp. *Ostrich* 90(2): 145-172. <https://doi.org/10.2989/00306525.2019.1584925>. IF: 0.443
- Mandiwana-Neudani, T.G., Little, R.M., Crowe, T.M. & Bowie, R.C.K.** 2019. Taxonomy, phylogeny and biogeography of 'true' francolins: Galliformes, Phasianidae, Phasianinae, Gallini; *Francolinus*, *Ortygornis*, *Afrocolinus* gen. nov., *Peliperdix* and *Scleroptila* spp. *Ostrich* 90(3): 191–221. <https://doi.org/10.2989/00306525.2019.1632954> IF: 0.443
- Masello, J.F., Quillfeldt, P., Sandoval-Castellanos, E., Alderman, R., Calderón, L., Cherel, Y., Cole, T.L., Cuthbert, R.J., Marin, M., Massaro, M., Navarro, J., Phillips, R.A., **Ryan, P.G.**, Shepherd, L.D., Suazo, C.G., Weimerskirch, H. and Moodley, Y. 2019. Additive traits lead to feeding advantage and reproductive isolation, promoting homoploid hybrid speciation. *Molecular Biology and Evolution* 36(8):1671–1685 <https://doi.org/10.1093/molbev/msz090> IF: 14.797
- Mzumara, T.I., Martin, R.O.,** Tripathi, H., Phiri, C. and **Amar, A.** 2019. Distribution of a habitat specialist: Mopane woodland structure determines occurrence of Near Threatened Lilian's Lovebird *Agapornis lilianae*. *Bird Conservation International* 29(3): 413-422. [doi:10.1017/S0959270918000370](https://doi.org/10.1017/S0959270918000370) IF: 1.725
- Nebel, C.,** Gamauf, A., Haring, E., Segelbacher, G., Vali, U., Villers, A. and Zachos, F.E. 2019. New insights into population structure of the European golden eagle (*Aquila chrysaetos*) revealed by microsatellite analysis. *Biological Journal of the Linnean Society* 128: 611–631. <https://doi.org/10.1093/biolinnean/blz130> IF: 2.203
- Nebel, C.,** Kadletz, K., Gamauf, A., Haring, E., Sackl, P., Tiefenbach, M., Winkler, H. and Zachos, F.E. 2019. Witnessing extinction: Population genetics of the last European Rollers (*Coracias garrulus*) in Austria and a first phylogeographic analysis of the species across its distribution range. *Journal of Zoological Systematics and Evolutionary Research* 57(2): 461-475. <https://doi.org/10.1111/jzs.12256> IF: 2.268

- Oswald, K.N., Smit, B., **Lee, A.T.** and **Cunningham, S.J.**, 2019. Behaviour of an alpine range-restricted species is described by interactions between microsite use and temperature. *Animal Behaviour* 157: 177-187. <https://doi.org/10.1016/j.anbehav.2019.09.006> IF: **2.675**
- Pastor-Prieto, M., Ramos, R., Zajková, Z., Reyes-González, J.M., Rivas, M.L., **Ryan, P.G.** and González-Solís, J. 2019. Spatial ecology, phenological variability and moulting patterns of the Endangered Atlantic petrel *Pterodroma incerta*. *Endangered Species Research*, 40: 189-206. <https://doi.org/10.3354/esr00991> IF: **2.122**
- Pekor, A., Miller, J.R., Flyman, M.V., Kasiki, S., Kesch, M.K., **Miller, S.M.**, Uiseb, K., Van der Merve, V. and Lindsey, P.A. 2019. Fencing Africa's protected areas: Costs, benefits, and management issues. *Biological Conservation* 229: 67-75. <https://doi.org/10.1016/j.biocon.2018.10.030> IF: **4.451**
- Potgieter, L.J., Gaertner, M., **O'Farrell, P.J.** and Richardson, D.M. 2019. Perceptions of impact: invasive alien plants in the urban environment. *Journal of Environmental Management* 229: 76-87. <https://doi.org/10.1016/j.jenvman.2018.05.080> IF: **4.865**
- Reading, R.P., Bradley, J., Hancock, P., **Garbett, R.**, Selebatso, M. and Maude, G., 2019. Home-range size and movement patterns of Hooded Vultures *Necrosyrtes monachus* in southern Africa. *Ostrich* 90(1): 73-77. <https://doi.org/10.2989/00306525.2018.1537314> IF: **0.443**
- Reynolds, C.** 2019. Waterbirds: Birds of a feather flock together*i*. Editorial *Ostrich* 90(4): iii-iv. <https://doi.org/10.2989/00306525.2019.1701303> IF: **0.443**
- Rink, A.N., Altwegg, R., Edwards, S., **Bowie, R.C.** and Colville, J.F. 2019. Contest dynamics and assessment strategies in combatant monkey beetles (Scarabaeidae: Hopliini). *Behavioral Ecology* 33(3): 713-723. [10.1093/beheco/arz008](https://doi.org/10.1093/beheco/arz008) IF: **2.695**
- Risi, M.M.**, **Jones, C.W.**, **Schoombie, S.** and **Ryan, P.G.** 2019. Plumage and bill abnormalities in albatross chicks on Marion Island. *Polar Biology* 42: 1615–1620. <https://doi.org/10.1007/s00300-019-02528-x> IF: **2.002**
- Robert, A., Lengagne, T., **Melo, M.**, Gardette, V., Julien, S., **Covas, R.**, Gomez, D. and **Doutrelant, C.** 2019. The theory of island biogeography and soundscapes: Species diversity and the organization of acoustic communities. *Journal of Biogeography* 46(9): 1901-1911. <https://doi.org/10.1111/jbi.13611> IF: **3.884**
- Roscales, J.L., Vicente, A., **Ryan, P.G.**, González-Solís, J. and Jiménez, B. 2019. Spatial and interspecies heterogeneity in concentrations of perfluoroalkyl substances (PFASs) in seabirds of the Southern Ocean. *Environmental Science & Technology* 53: 9855–9865. <https://doi.org/10.1021/acs.est.9b02677> IF: **7.149**
- Ryan, P.G.** and **Dilley, B.J.**, 2019. Intertidal foraging by Tristan Thrushes. *Ostrich* 90(2): 179–181. <https://doi.org/10.2989/00306525.2019.1581297> IF: **0.443**
- Ryan, P.G.**, **Dilley, B.J.**, Davies, D., Glass, T. and Abadi, F. 2019. Short-term movement patterns, population estimates and breeding biology of an island endemic bird, the Tristan Thrush. *Revista Brasileira de Ornitologia* 27(4): 245-252. IF **0.299**.
- Ryan, P.G.**, **Dilley, B.J.**, Ronconib, R.A. and Connan, M. 2019. Rapid increase in Asian bottles in the South Atlantic Ocean indicates major debris inputs from ships. *Proceedings of the National Academy of Sciences of the United States of America (PNAS)* 116(42): 20892–20897. <https://doi.org/10.1073/pnas.1909816116> IF: **9.580**

- Sherley, R.B., Crawford, R.J.M., Dyer, B.M., Kemper, J., Makhado, A.B., Masollta, M., **Pichegru, L.**, **Pistorius, P.A.**, Roux, J-P., **Ryan, P.G.**, Tom, D., Upfold, L. and Winker, H. 2019. Identification of land predators of African Penguins *Spheniscus demersus* through post-mortem examination. *Ostrich* 90(4): 359-372. <https://doi.org/10.2989/00306525.2019.1697971> IF: **0.443**
- Sorensen, M.C., Dixit, T., Kardynal, K.J., Newton, J., Hobson, K.A., Bensch, S., Jenni-Eiermann, S. and **Spottiswoode, C.N.** 2019. Migration distance does not predict blood parasitism in a migratory songbird. *Ecology and Evolution* 9(14): 8294-8304. <https://doi.org/10.5061/dryad.57c0420>. IF: **2.415**
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