Nico Lübcker (he/him), Ph.D. CV

Postdoctoral Scientist
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11 November 2022

EDUCATION

Ph.D. Zoology (2020), M.Sc. (2016) B.Sc. Honors (2011), B.Sc. (2010), University of Pretoria, South Africa.

PROFILES

Google Scholar: https://scholar.google.co.za/citations?user=mXn-ZrMAAAAJ&hl=en&oi=ao
Google Scholar *H*-index = 9
ResearchGate: https://www.researchgate.net/profile/Nico_Luebcker
Orcid ID: https://orcid.org/0000-0001-7141-6669
https://www.linkedin.com/in/nico-lubcker-73249336/

EXPERIENCE

2021 - Present	**Postdoctoral Scientist**, Department of Biology, University of New Mexico (UNM). (1) Using compound-specific stable isotope analysis to trace energy flow in food webs and explore how nutrients are allocated to growth and reproduction in a diverse range of marine and terrestrial fauna; (2) developing a single-sample triple-oxygen isotope method that can be used to quantify how much an organism relies on metabolic water production to maintain their water balance. Advisors: Dr. SD Newsome, in collaboration with Dr. Zahary Sharp & Dr. JP Whiteman.
2020–2021	**Researcher,** University of Pretoria (UP), Department of Zoology & Entomology, Pretoria, South Africa (SA). (June 2021). Performed duties to support the Marion Island Marine Mammal Programme (MIMMP) (https://www.marionseals.com/).
2016–2020	**Ph.D. (Zoology),** UP, Mammal Institute, Department of Zoology & Entomology, SA. *Dissertation*: "Chronological monitoring of nutritional and hormonal status of elephant seals through whisker analysis". *Supervised by* Drs. Nico de Bruyn & Robert Millar, University of Pretoria, SA. *Formal collaborators* Drs. Seth Newsome & John Whiteman, UNM, and Amanda Swart, University of Stellenbosch, SA. *External examinators*: Drs. Daniel Costa, Daniel Crocker. Additionally worked as a technician on a Technology Innovation Agency, SA funded project: "*Environmental regulation of large mammal body size assessed through automated three-dimensional photogrammetry camera trap*" in Kruger National Park, SA (2016-2018). Participated in three Antarctica expeditions (> 6 weeks each) to study marine megafauna (2016-ongoing).
2015–2016	**M.Sc. (Zoology)** (by Research), Department of Zoology and Entomology, UP, SA. D*istinction.* *Thesis:* "Diet of underyearling southern elephant seals *Mirounga leonina* from Marion Island: a stable isotope investigation". *Supervised by* Drs Marthán N Bester & Prof. PJN de Bruyn.
2012–2013	**Employed full-time** (14 months) on Marion Island in the southern Indian Ocean, as Research field assistant by the Department of Environmental Affairs (DEA), South African National Antarctic Programme (SANAP), under the MIMMP, Mammal Research Institute, Department of Zoology and Entomology, UP. Completed First Aid (level 1) and Fire Fighting training (level 2).

2011 **B.Sc. (Honours) Zoology** (project and course-based), Department of Zoology and Entomology, UP. *Distinction*.
Project: "Assessing the invasive potential of silver carp (*Hypophthalmichthys molitrix*) in South Africa". *Supervised by* Drs. MP Robertson, S Woodborne, T Zengeya, & J Dawbroski. The project was based on two components: 1) an ecological niche modeling component using MaXent, and 2) a combined stomach content and stable isotopic component.

2008–2010 **B.Sc. (Zoology)** (Undergraduate degree), Department of Zoology and Entomology, UP. *Completed within minimum time (3 yrs)*. Main subjects Zoology and Biochemistry. Employed as a Mentorship student by the University of Pretoria in 2010.

PUBLICATIONS *Student Author

Lübcker N, Newsome SD, Bester MN, de Bruyn PJN. 2021. Validating the use of bulk tissue stable isotope and amino acid $\delta^{15}N$ values measured in molted hair and epidermis of elephant seals to assess temporal foraging niche specialization. *Marine Ecology Progress Series* 673:229-243. https://doi.org/10.3354/meps13772.

*Padayachee K, Malan G, Lübcker N, Hall G, Woodborne S. 2021. Differences in the dietary habits of Verreaux's Eagles *Aquila verreauxii* between peri-urban and rural populations. *Bird Conservation International*. https://doi.org/10.1017/S0959270920000015.

*van Tonder A, Lübcker N, Guerreiro M, Xavier JC, Cherel Y, de Bruyn PJN. 2021. Ecology of *Moroteuthopsis longimana* at the sub-Antarctic Prince Edward Islands, revealed through stable isotope analysis of squid beaks. *Marine Ecology Progress Series* 658:105-115. https://doi.org/10.3354/meps13556.

Bester M, Lübcker N, Haddad W, Bornemann H, Wege, M. 2021. Antarctic pack ice seal observations during spring across the Lazarev Sea. *Polar Record*, 57, E12. https://doi:10.1017/S003224742100005X.

Lübcker N, Whiteman JP, Newsome SD, Millar RP, de Bruyn PJN. 2020. Can the carbon and nitrogen isotope values of offspring be used as a proxy for their mother's diet? Using foetal physiology to interpret bulk tissue and amino acid $\delta^{15}N$ values. *Conservation Physiology* 8, coaa060. https://doi.org/10.1093/conphys/coaa060

Lübcker N, Whiteman JP, Millar RP, de Bruyn PJN, Newsome SD. 2020. Fasting affects amino acid nitrogen isotope values: a new tool for identifying nitrogen balance of free-ranging mammals. *Oecologia* 193:53-65. *https://doi.org/10.1007/s00442-020-04645-5*.

Lübcker N, Bloem LM, du Toit T, Swart P, de Bruyn PJN, Swart A, Millar RP. 2020. What's in a whisker? High-throughput analysis of twenty-eight C_{19} and C_{21} steroids in mammalian whiskers by ultra-performance convergence chromatography-tandem mass spectrometry. *Journal of Chromatography B* 1141:122028. https://doi.org/10.1016/j.jchromb.2020.122028.

Bester MN, Wege M, Lübcker N, Postma M, Syndercombe G. 2019. Opportunistic ship-based census of pack ice seals in eastern Weddell Sea, Antarctica. *Polar Biology* 42:225-229. https://doi.org/10.1007/s00300-018-2401-7.

Wege M, Bornemann H, Lubcker N, Postma M, Bester MN. 2018. Habitat use and diet of the Ross seal in the eastern Weddell Sea, 5th South African Marine Mammal Colloquium, Port Elizabeth, South Africa, 20 August 2018 - 23 August 2018. https://epic.awi.de/id/eprint/48787/.

Lübcker N, Reisinger RR, Oosthuizen WC, de Bruyn PJN, van Tonder A, Bester MN. 2017. Low trophic level diet of juvenile southern elephant seals *Mirounga leonina* from Marion Island: a stable isotope investigation using vibrissal regrowths. *Marine Ecology Progress Series* 577:237-250. https://doi.org/10.3354/meps12240.

Lübcker N, Dabrowski J, Zengeya TA, Oberholster PJ, Hall G, Woodborne S, Robertson MP. 2016. Trophic ecology and persistence of invasive silver carp *Hypophthalmichthys molitrix* in an oligotrophic South African impoundment. *African Journal of Aquatic Science* 41:399-411. https://doi.org/10.2989/16085914.2016.1246356.

Lübcker N, Condit R, Beltran RS, de Bruyn PJN, Bester MN. 2016. Vibrissal growth parameters of southern elephant seals *Mirounga leonina*: obtaining fine-scale, time-based stable isotope data. *Marine Ecology Progress Series* 559:243-255. https://doi.org/10.3354/meps11899.

Reisinger R, Gröcke DR, Lübcker N, McClymont EL, Hoelzel AR, de Bruyn PJN. 2016. Variation in the diet of killer whales *Orcinus orca* at Marion Island, Southern Ocean. *Marine Ecology Progress Series* 549:263-274. https://doi.org/10.3354/meps11676.

Lübcker N, Zengeya TA, Dabrowski J, Robertson MP. 2014. Predicting the potential distribution of invasive silver carp, *Hypophthalmichthys molitrix* in southern Africa. *African Journal of Aquatic Science* 39:157-165. https://doi.org/10.2989/16085914.2014.926856.

Dabrowski J, Hall G, Lübcker N, Oberholster PJ, Phillips DL, Woodborne S. 2014. Piscivory does not cause pansteatitis (yellow fat disease) in *Oreochromis mossambicus* from an African subtropical reservoir. *Freshwater Biology* 59:1484-1496. https://doi.org/10.1111/fwb.12360.

Woodborne S, Huchzermeyer KDA, Govender D, Pienaar DJ, Hall G, Myburgh JG, Deacon AR, Venter J, Lubcker N. 2012. Ecosystem change and the Olifants River crocodile mass mortality events. *Ecosphere* 3:1-17. https://doi.org/10.1890/ES12-00170.1.

SUBMITTED MANUSCRIPTS IN REVIEW /IN PRESS

Moreau et al. Wind-driven upwelling of iron sustain dense phytoplankton blooms and productive food webs in the eastern Weddell Gyre (reference number: NCOMMS-22-37941), *submitted to Nature Communications*.

Lübcker N. Use of amino acid stable isotopes to investigate capital versus income breeding strategies by three species of Arctic-breeding migratory geese, *submitted to Journal of Animal Ecology*.

Information regarding additional research projects and manuscripts in various stages of completion can be provided on request.

NON-PEER-REVIEWED JOURNAL ARTICLES/OTHER CONTRIBUTIONS

PJN de Bruyn, Oosthuizen WC, Wege M, Lübcker N, Bester MN (2015/16) Marion Island Marine Mammal Programme (Pinnipeds): Annual work plan M72, Mammal Research Institute, University of Pretoria. pp. 1 – 45.

Cerfonteyn M, Lübcker N, Postma M, Bester M (2016) Wilson's storm petrels mating and resting on Antarctic ice-breaker. Biodiversity Observations ISSN 2219-0341.

TEACHING & ADVISING EXPERIENCE

2021-2022	Co-group leader and lecturer during the Stable Isotope Biochemistry and Ecology Course (Isocamp), University of New Mexico.
2022	Advised an honors student, Bianca Coulson, until completion. Project: "Age- and sex-related trophic niche partitioning in Marion Island Southern elephant seals (*Mirounga leonina*): A whisker-based stable isotope analysis".
2017-2022	Co-advised three MSc students. 1) Mukutyu I. Thesis: "*Fine-scale diving and foraging ecology of two Marion Island fur seal species*". Graduated. 2) Mvunelo A. Thesis: "Change in isotopic features of ingested prey after digestion: a captive feeding study of fur seals, *Arctocephalus pusillus pusillus* and *A. australis*". Final stages. 3) van Tonder A. Thesis: "*Modelling lanternfish contribution to sub-Antarctic Prince Edward Island predators' diets using stable isotope values from fecal otoliths*". Graduated.
2017-2018	Co-advised MSc student. 1) Prinsloo N. 2018. Thesis: "*Evaluating Cape mountain zebra phenotypic variation by quantifying differences in stripe patterns and comparing dietary niche of population occurring*". Degree obtained with distinction.
2016	Co-advised two honors students until completion in 2016. 1) van Tonder A. 2016. Project: "*Isotopic analysis of the cephalopod assemblage around the subantarctic Prince Edward Islands: insight from multiple predators as samplers*". Degree obtained with distinction. 2) Prinsloo N. 2016. Project: "*Trophic niche use influences mass gain in naïve under-yearling southern elephant seals Mirounga leonina".*
2014, 2015	Mentored three students, University of Pretoria's 3rd year Mentorship Programme.

AWARDS AND FELLOWSHIPS

2019	Society for Marine Mammalogy Small Grants in Aid of Research (USD $2000): "Persistent organic pollutants extracted from pinniped keratinous tissues: Influence of physiology on measured pollutant concentrations". World Marine Mammal Conference Travel Grant (USD $700)
2018	Best Ph.D. presenter at the annual Zoology & Entomology presentations, Pretoria. Society for Marine Mammalogy Small Grants in Aid of Research (USD $2000), Project Title "A multidisciplinary approach to assess the intermittent breeding pattern observed in southern elephant seals at Marion Island in the Southern Ocean".
2017	University of Pretoria Postgraduate Study Abroad Bursary Programme Award (R30 000), National Research Foundation Local and International Travel Bursary Awards (R15 000 and R50 000, respectively). NRF Grant Number 95199. World Marine Mammal Conference Travel Grant (USD $550). Second best Ph.D. presenter at the annual Zoology & Entomology presentations, Pretoria.
2016-2019	Department of Science and Technology (DST)/ National Research Foundation, Innovation Doctoral Scholarship (R120 000/y for four years).
2013-2015	NRF-Grant holder bursary (under the supervision of Prof. MN Bester) (R40 000/y for three years). Academic honorary colors, UP, for exceptional achievement during M.Sc. (Zoology) degree. Postgraduate Study Abroad Bursary Programme Award 2014 from UP (R30 000) and attended the prestigious "Stable Isotope Biochemistry and Ecology Course 2014" in the USA.
2012	Academic honorary colors, UP, for exceptional achievement during B.Sc. (Hons) degree.
2011	Second best honors presenter at the annual Zoology & Entomology presentations, Pretoria.
2010	UP Student Mentorship Award (USD $550).
2007-2010	Three-times Protea Angler (national colors) (Competed in World Championships in Prague, Belgium, and Portugal).

COURSE AND CERTIFICATES

2019	General Natural & Agricultural Science Tutor Training (19 July 2019), Department of Education Innovation, University of Pretoria, South Africa.
2015	Statistics R programming course (14-17 July 2015), University of Witwatersrand (WITS), in collaboration with the Centre for Research into Ecological and Environmental Modelling, University of St Andrews, UK.
2014	Stable Isotope Biochemistry and Ecology Course (Isocamp) (10-24 June 2014), University of Utah, USA.

SERVICE AND OUTREACH

Peer-Reviewed >30 Manuscripts

Journals include: Canadian Journal of Fisheries and Aquatic Sciences, Canadian Journal of Zoology, Conservation Physiology, Ecosphere, Environmental Biology of Fishes, Mammal Review, Mammalian Biology, Marine Biology, Marine Ecology Progress Series, Marine Mammal Science, Rapid Communications in Mass Spectrometry, Scientific Reports. *Verified Reviewer Profile is available from https://www.webofscience.com/wos/author/record/414832*.

SELECTED SCHOLARLY PRESENTATIONS (*invited talks)

Lübcker N, Whiteman JP, de Bruyn PJN, Newsome SD. 2021. Virtual talk. Amino acid stable isotope values as tool to obtain physiological data of free-ranging marine predators. *IsoEcol Conference*.

Lübcker N, de Bruyn PJN, Millar RP, Whiteman JP, Newsome SD. 2019. Speed Talk. Amino acid nitrogen isotope values as new tool for identifying fasting events in free-ranging marine mammals. *World Marine Mammal Conference*, Barcelona, Spain.

Lübcker N, de Bruyn PJN, Millar RP, Whiteman JP, Newsome SD. 2019. Presentation (20 minutes). Amino acid nitrogen isotope values as new tool for identifying fasting events in free-ranging marine mammals. *Stable Isotope Workshop*, *World Marine Mammal Conference*, Barcelona, Spain.

Lübcker N*, de Bruyn PJN, RP Millar, Swart A, du Toit T, Bloem L, Newsome SD. 2018. Presentation. Monitoring steroid hormone secretion in elephant seal single whiskers. *International Congress of Endocrinology (ICE-SEMDSA)*, South Africa.

Lübcker N*, de Bruyn PJN, RP Millar, Whiteman JP, Swart A, Newsome SD. 2018. Presentation (45 minutes) Using stable isotopes to study marine mammal ecology: Are pregnant females "what they eat"? *University of California, Santa Cruz*.

Lübcker N, de Bruyn PJN, Millar RP, Swart A, Newsome SD, Whiteman JP. 2018. Presentation. Keratinous tissue as matrix for obtaining time-based biochemical data. *South African National Antarctic Programme Symposium*, South Africa.

Lübcker N, de Bruyn PJN, Millar RP, Newsome SD, Whiteman JP. 2018. Presentation. Using stable isotopes to study marine mammal ecology: Are pregnant females "what they eat"? *5th African Marine Mammal Colloquium: "New frontiers in African marine mammalogy"*, South Africa.

Lübcker N, Reisinger RR, Oosthuizen WC, de Bruyn PJN, Bester MN. 2017. Presentation and Poster. Whiskers of southern elephant seals as matrix for obtaining fine-scale dietary data. *Combined Congress of the Entomological and Zoological Societies of Southern Africa*, South Africa.

Lübcker N*, Reisinger RR, Oosthuizen WC, Condit R, Beltran RS, van Tonder A, Pistorius PA, de Bruyn PJN, Padayachee K, Malan G, Swart P, Hall G, Woodborne S, Bester MN. 2017. Presentation (45 minutes). Isotopic dietary reconstructions: Use of nitrogen and carbon isotopes measured in whiskers of southern elephant seals *Center for Stable Isotopes (CSI), Seminar Series* University of New Mexico, USA.

Lübcker N, Reisinger RR, Oosthuizen WC, de Bruyn PJN, Bester MN. 2017. Poster. Keratinous tissue as matrix for obtaining time-based biochemical data. *22nd Biennial Society for Marine Mammalogy Conference*, Canada.

2016. Attended Mammal Research Institute, University of Pretoria, Symposium, South Africa. *Setting the stage for the next 20 years of African mammal research activities in the face of ongoing socio-political, socio-economic and environmental changes*, South Africa. Also acted as scribed.

Information regarding additional talks (e.g., student talks) can be provided on request.

SKILLS

Research, Statistics, Lecturing, R Statistical Programming, Qualitative Research, ArcGIS, and graphical design programs (e.g., Abobe Illustrator). Academically fluent in Afrikaans and English. Experienced with Isotopic Ratio Mass Spectrometry (IRMS), as well as with both Liquid and Gas Mass Spectrometry (HPLC/GC), Ultraperformance Convergence Chromatography (UPC^2), Picarro water analyzer, amino acid compound-specific stable isotope using gas chromatography-combustion-isotope ratio mass spectrometry (GC-C-IRMS), and dual inlet isotope ratio mass spectrometer (Thermo Scientific™ 253 Plus), linked to in-line and offline vacuum lines. This includes the wet chemistry skills required to prepare samples. I have extensive project management experience gained through my continuous (2012-ongoing) involvement with long-term mark-recapture programs.

Thank you for your consideration.

N. Lübcker (he/him)