Félicie Dhellemmes

Leibniz institute for Freshwater Ecology and Inland Fisheries
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Post-Doctoral Researcher - Leibniz institute for Freshwater Ecology and Inland Fisheries
Principal Investigator - Bimini Biological Field Station Foundation (Bahamas)

Animal personality - Behavioural Ecology - Phenotypic Plasticity - Marine ecology - Adaptation

Education

2015-20 Ph.D., Humboldt Universität zu Berlin, Berlin, Germany

2013 M.Sc. Eng., ISA graduate school of Agriculture and Bioengineering, Lille, France

2013 Animal farming exchange semester, ISARA, Lyon, France

2012 Marine Biology exchange semester, Universidad Autónoma de Baja California, Ensenada, Mexico

Research experience

2021 Post-Doctoral research, Leibniz institute for Freshwater Ecology and Inland Fisheries & Humboldt-Universität zu Berlin. Working group: Prof. Robert Arlinghaus.
Project: "Movement ecology of pike in a brackish water lagoon".

2015-20 Doctoral research, Leibniz institute for Freshwater Ecology and Inland Fisheries & Humboldt-Universität zu Berlin. Supervisor: Prof. Jens Krause.
Project: "Ecological consequences of personality in sharks".
Principal investigator, Bimini Biological Field Station, Bahamas.
Projects: "Lemon shark family tree", "Conservation of endangered great hammerheads", "Movement networks and habitat preferences of elasmobranchs in Bimini" and "Characterization of a Tiger shark nursery in Bimini".

2020 Research assistant, Leibniz institute for Freshwater Ecology and Inland Fisheries

Project: "AQUATAG: Recreational activities on freshwaters: Dynamics, environmental impacts, social importance and sustainable management", working group "River revitalization".
Field assistant monitoring the impact of canoe tourism on bird populations in collaboration with Dr. C. Wolter and Ph.D. candidate B. Wegner.

2018-19 Research project, Leibniz institute for Freshwater Ecology and Inland Fisheries
Projects: "Comparative study of the oil glands in billfishes" and "Linking hunting weaponry to attack strategies in sailfish and striped marlin"
In collaboration with Prof. J. Krause and Dr. M. Hansen.

2015 Research assistant, Macquarie University, Sydney (Australia, 1 month)
Project: "Into the wild: developing field tests to examine the link between elasmobranch personality and laterality"
In collaboration with Dr. C. Vila Pouca and Dr. C. Brown

2013 M.Sc. Research, Groupe ISA Lille (France, 6 months)
Project: "Elasmobranchs' personality: Using habituation to demonstrate personality in the juvenile lemon sharks' population of the Bimini islands"
Supervisors: Drs. J. Follet and H. Leruste

2012 Research assistant, Universidad Autónoma de Baja California (Mexico, 6 months)
Project: "Study of the Whale Shark (*Rhincodon typus*) population based in the Los Angeles Bay (Baja California)"
Supervisor: Dr. R. Enriquez-Andrade

Peer-reviewed publications

2021 **Dhellemmes, F.**, Smukall, M. J., Guttridge, T. L., Krause, J., & Hussey, N. E. (2021). Predator abundance drives the association between exploratory personality and foraging habitat risk in a wild marine meso-predator. Functional Ecology, 1365-2435.13874. doi: 10.1111/1365-2435.13874

Heim, V., **Dhellemmes, F.**, Smukall, M. J., Gruber, S. H., & Guttridge, T. L. (2021). Effects of Food Provisioning on the Daily Ration and Dive Site Use of Great Hammerhead Sharks, Sphyrna mokarran. Frontiers in Marine Science, 8(May). doi: 10.3389/fmars.2021.628469

Smukall, M. J., Guttridge, T. L., **Dhellemmes, F.**, Seitz, A. C., & Gruber, S. H. (2021). Effects of leader type and gear strength on catches of coastal sharks in a longline

survey around Bimini, The Bahamas. Fisheries Research, 240(September 2020), 105989. doi: 10.1016/j.fishres.2021.105989

Heinrich, D., **Dhellemmes, F.**, Guttridge, T. L., Smukall, M., Brown, C., Rummer, J., … Huveneers, C. (2021). Short-term impacts of daily feeding on the residency, distribution and energy expenditure of sharks. Animal Behaviour, 172, 55–71. doi: 10.1016/j.anbehav.2020.12.002

2020 **Dhellemmes, F.**, Finger, J.-S., Smukall, M. J., Gruber, S. H., Guttridge, T. L., Laskowski, K. L., & Krause, J. (2020). Personality-driven life history trade-offs differ in two subpopulations of free-ranging predators. Journal of Animal Ecology, 89(8), 1–13. doi: 10.1111/1365-2656.13283

Dhellemmes, F., Finger, J.-S., Laskowski, K. L., Guttridge, T. L., & Krause, J. (2020). Comparing behavioural syndromes across time and ecological conditions in a free-ranging predator. Animal Behaviour, 162, 23–33. doi: 10.1016/j.anbehav.2020.01.009

Dhellemmes, F., Hansen, M. J., Bouet, S. D., Videler, J. J., Domenici, P., Steffensen, J. F., … Krause, J. (2020). Oil gland and oil pores in billfishes: in search of a function. The Journal of Experimental Biology, jeb.224956. doi: 10.1242/jeb.224956

Hansen, M. J. J., Krause, S., Breuker, M., Kurvers, R. H. J. M., **Dhellemmes, F.**, Viblanc, P. E., … Krause, J. (2020). Linking hunting weaponry to attack strategies in sailfish and striped marlin. Proceedings of the Royal Society B: Biological Sciences, 287(1918), 20192228. doi: 10.1098/rspb.2019.2228

2017 Finger, J. S., **Dhellemmes, F**., & Guttridge, T. L. Personality in Elasmobranchs with a Focus on Sharks: Early Evidence, Challenges, and Future Directions. In Personality in Nonhuman Animals (pp. 129–152). Cham: Springer International Publishing.

2016 Finger, J. S.*, **Dhellemmes, F.***, Guttridge, T. L., Kurvers, R. H. J. M., Gruber, S. H., & Krause, J. Rate of movement of juvenile lemon sharks, Negaprion brevirostris in a novel open field, are we measuring activity or reaction to novelty? Animal Behaviour, (116), 75–82.
***Shared first authorship**

Upcoming publications

Smukall M.J., Carlson J., Kessel S.T., Guttridge T.L., **Dhellemmes F.**, Seitz A. C., Gruber S.H. Thirty-five years of tiger shark *Galeocerdo cuvier* relative abundance in Bimini, Bahamas and the Southeastern United States, with a comparative across jurisdictional bounds. Under review - Journal of Fish Biology

Field skills

Behavioural testing

Designing and implementation of behavioural tests for Juvenile sharks. More than 600 individuals successfully tested.

Acoustic telemetry

Designing and maintenance of telemetry arrays with up to 140 receivers (Vemco and Sonotronics, maximum 40m depth). Surgical implantation of over 150 acoustic tags on 8 different elasmobranch species and one teleost species. Specialist of fragile juvenile shark surgery (<50cm).

Shark capture and handling

Leader of all gillnetting effort targeting juvenile lemon sharks in Bimini for four years (1169 sharks captured). Co-leader of a bi-monthly shallow-water longlining program targeting 12 species of shark for four years (646 sharks captured), Co-leader of a deep-water longline (6 times a year, four years, 46 sharks captured), extensive experience in rod and reel fishing, poly-ball fishing, hand capture and seine netting of sharks, rays and bony fishes. Handling of juvenile (4 species) and adults (10 species) sharks and rays ranging from 20cm to 400cm total length.

Boating skills

Certified captain in France for boats up to 20m. Daily ocean boat driving for four years (Outboard engines only, 5 to 10m, 40 to 240 hp). I can diagnose and repair common outboard engine issues in the field and do a full servicing on most Mercury 4-stroke engines up to 150 horsepower. Certified captain in German in both coastal and inland waters.

Unmanned Aerial Vehicle handling

Over 50 hours of flight-time using a DJI phantom 3, Phantom 3SE and Phantom 4 pro v2 drones for various research project over water. European drone license to fly in the “open category” A1-A3.

Apnea and scuba-diving

Completed most of my field work in apnea diving and snorkelling: acoustic receiver maintenance, shark and turtle hand captures, checking of traps, spearfishing, billfish observations. PADI rescue diver with lots of experience diving for research: acoustic receiver maintenance, behavioural observations.

Lab and analytical skills

R programming and statistical analysis

Fast and precise programming in R: Large dataset handling, creation of complex graphs (including animated maps), creation of complex functions (i.e. Interactive database creation for fast, accurate and easy data entering).
Comfortable using statistics applied to field biology: Mixed effect models (Frequentist (lme4 and nlme) and Bayesian approaches (MCMCglmm and Stan)), meta-analysis and descriptive statistics.

Python programming

Intermediate Python programming: Used when the datasets are too big to be handled efficiently in R. Use of Jupyter notebook for handling data in R and python simultaneously.

MySQL programming

Intermediate MySQL programming: Can create and populate database using MySQL language (experience on Beekeeper Studio) or in a R integration.

QGIS

Creation of maps, shapefiles and handling of GPS data.

Sample preparation for stable isotope analysis

Meticulous preparation of hundreds of fin and blood samples.

The European Synchrotron Radiation Facility

Use of a beamline dedicated to biomedical imaging to scan billfish rostra during 36h of beam-time.

Teaching experience

Bimini Biological Field Station

2015-18 Shark biology. *University undergraduate courses taught six times per year.*

Shark morphology and dissection. *Shark dissections carried out for university courses three times per year.*

The juvenile lemon shark as a model to investigate the consequences of animal personality. *Lecture given monthly to the new interns.*

Training in the field of over 100 volunteers at the field station

Supervision of students

2018-21 C. White. Anthropogenic Impacts on the Sensory Capabilities of the Lemon Shark. Ph.D. Thesis. University of York, United Kingdom. Co-supervisor.

2017-20 D. Heinrich. There is a time and a place for food – can juvenile lemon sharks (*Negaprion brevirostris*) work it out? Ph.D. thesis, Flinders University Australia. Co-supervisor.
One co-authored publication published in Animal Behaviour. One co-authored publication in preparation.

2017-19 V. Heim. Behaviour at the provisioning site and the effects on the habitat and space-use of the great hammerhead shark, *Sphyrna mokarran*, in Bimini, Bahamas. M.Sc. thesis. Universität Basel, Switzerland. Co-supervisor.
One co-authored publication published in Frontiers in Marine Science

2016-17 H. Gray. Can personality act as an indicator of movements in juvenile lemon sharks? B.Sc. thesis. Cardiff University, England. Main supervisor.
One co-authored publication in preparation.

2016 J. Baeyaert. Wild Spatial Behaviour & Personality Traits: A comparison study for juvenile lemon sharks. M.Sc. thesis. Universidad do Algarve, Portugal. Main supervisor.
One co-authored publication in preparation.

2016 P. Burke. Use of baited remote underwater video surveys to assess the diversity and distribution of elasmobranchs and their communities in Bimini, Bahamas. M. Sc. Thesis. University of Ghent, Belgium, Co-supervisor.

2015 L. Dickson. Does spatial distribution of lemon sharks (*Negaprion brevirostris*) in the wild correlate with temperament in semi-captivity? M.Sc. thesis. University of Southampton, England and University of Liege, Belgium. Co-supervisor
One co-authored publication in preparation.

Grants and awards

2016-19 Elsa Neumann stipendium des Landes. Ph.D. Stipend support. (13 236€ per year)

2015-18 Bimini Biological Field Station Ph.D. scholarship. Equipment and boat-use fees covered during the entire duration of the Ph.D. project. (Approx. 12 000$ per year)

2017 Save our Seas Foundation special keystone grant. 7000$ for equipment.

2016 Save our Seas Foundation special keystone grant. 7000$ for equipment.

2016 Don L. Brumbaugh memorial equipment scholarship. 1000$ for equipment.

2015 Don L. Brumbaugh memorial equipment scholarship. 1000$ for equipment.

Conference presentation

2017 "Does personality reflect space-use in free-ranging juvenile lemon shark?" Oral presentation. Behaviour 2017. Estoril (Portugal)
Funded through the ASAB conference grant.

2016 "Does personality reflect space-use in juvenile lemon shark?" Oral presentation. European Elasmobranch Association 2016. Bristol (England)
Funded through the Save Our Seas Foundation student's travel grant.

2015 "Habituation as a tool to interpret an open-field test adapted for juvenile lemon sharks (*Negaprion brevirostris*)" Oral presentation. Behaviour 2015. Cairns (Australia)
Funded through a crowdfunding effort which resulted in 2940€ raised by 63 people in less than two months.

2014 "Exploring personality and a simple learning process in the juvenile lemon shark, *Negaprion brevirostris*" Oral presentation. European Elasmobranch Association 2014. Leeuwarden (Netherlands)
Funded through the Save Our Seas Foundation student's travel grant.

Selected media appearances

Shark week and shark fest

2021 Scientist/talent for "Shark gangs", National geographic SHARKFEST

2019 Big wave

2018 Bear vs. sharks; Sharkcam stakeout

2017 Phelps vs. sharks; Great hammerhead invasion; Shark school with Michael Phelps

Other TV appearances

2016 Xploration awesome planet with Philippe Cousteau Jr.

2015 Naomi's Nightmares of Nature; BBC Earth – SHARKS; Discovery Canada: Daily Planet; Animal Planet: River Monsters "Terror in Paradise"; 5m above and below the surface

Press

2019 Invitation to represent the Save Our Seas Foundation for the World Conference of Science Journalism

2018 Interview for HOERZU WISSEN

2017 "Dans le sillage des requins" PLONGEZ!

2014 "50 nuances de bleu" LE MONDE

Radio and podcasts

2020 Invited by presenter Alex Re to talk about lemon sharks and personality on the podcast "On Wildlife". https://onwildlife.org/lemon-sharks/

2015 Invitation by presenter Phil Staley for an interview on ABC Far North (Australia) to talk about sharks' personality.

Outreach and volunteering

I am active in the non-profit association Sharks4kids which provides free courses about the importance of sharks and healthy oceans to primary schools all over the world. I translate all their English material to French and occasionally participate in classes. I participate regularly to SkypeAScientist sessions, to talk about my research to children in English or in French.

I participate in outreach activities from the Bimini Biological Field Station such as: Animation of an ocean conservation booth at the Tortuga Music Festival (2018), School presentation "Life of marine Biologists" at St. John Vianney (Orlando, Florida, 2017). Open days of the field station yearly. Public tours of the field station multiple times a month.

I am a volunteer bike mechanic for the bi-monthly Leibniz Institute for Freshwater Ecology and Inland Fisheries bike repair afternoon organized by the doctoral students. The goal is to promote cycling to work by providing free bike maintenance and repair to employees and students.

I organized in 2020 a fundraiser for World Pangolin Day, in collaboration with Save Vietnam's Wildlife and Patagonia Berlin. This consisted of a day of raising public awareness in a Patagonia shop regarding the threats face by Asian Pangolins and an online fundraiser which resulted in the sponsoring of a pangolin in rehabilitation for almost 2 years.

Referees

Matthew J. Smukall
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