Personal Information

Name:	Hugo de Moura Flávio
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Education:

2017 - 2020: PhD in Atlantic salmon migration and ecology - Technical University of Denmark, Denmark

· Dissertation: *"Bottlenecks of Atlantic salmon smolt migration in freshwater and estuarine ecosystems"*

2014 - 2016: MSc in Ecology, Environment and Territory - University of Porto, Portugal

· Dissertation: *"Reconciling Agriculture and Stream Restoration in Europe"*

2011 - 2014: BSc in Biology - University of Porto, Portugal

2008 - 2010: Professional course in Environmental Management - Professional School Conde S. Bento, Portugal

Short courses:

Nov 2018: *"Introduction to Regression Models with Spatial and Temporal Correlation"*

· Provider: Highland Statistics Ltd.

· Modelling using INLA

Oct 2018: *"Introduction to Linear Mixed Effects Models and GLMM with R - Bayesian and frequentist approaches"*

· Provider: Highland Statistics Ltd.

May 2018: *"Laboratory Aquatic Animal Science Course - CAL-AQUA"*

· Provider: CIIMAR, Porto University

· FELASA Category B - "Persons carrying out animal experiments"

Feb 2018: *"Data Exploration, Regression, GLM & GAM with introduction to R"*

· Provider: Highland Statistics Ltd.

Sep 2015: *"The use of trait based approaches in community ecology and stress ecology"*

· Provider: IMAR - Instituto do Mar, Coimbra University

· Module I - Key concepts and terrestrial ecosystems

· Module II - Aquatic ecosystems

Professional Experience:

2024 - Now Post-doctoral fellow, Dalhousie University, Canada
- · Lead work funded under the DFO Canada Nature Fund grants.
- · Apply for additional grants that align with the lab strategic research direction.
- · Develop lab culture and processes through leadership activities.
- · Co-supervise MSc students and undergraduate scholars.
- · Contribute to field work and laboratory work in the Aquatron.

2020 - 2024 Post-doctoral fellow, Wilfrid Laurier University, Canada
- · Physiological effects of TFM on sea lamprey and non-target fishes (lake sturgeon and rainbow trout)
- · Intermittent flow respirometry, including design and setup of respirometry equipment.
- · Team coordination and student supervision.
- · Initial 2 year contract extended by 2 years.

2017 - 2020: PhD candidate, Technical University of Denmark
- · Study design for acoustic, radio and camera trap studies aiming to uncover Atlantic salmon smolt mortality rates across Europe
- · Analysis of complex data and presentation of the emerging conclusions arising from the multiple studies conducted under the SMOLTRACK project
- · Development of the R package actel

2017: Student assistant, Technical University of Denmark
- · Turbot acoustic telemetry in the Roskilde Fjord.
- · Maintenance and data extraction from Thelma® and Vemco® hydrophones.
- · Maintenance and data extraction from HOBO® environmental data loggers.

2017: Short term researcher, Technical University of Denmark
- · Conduct a review on the importance of hard-bottom reefs on commercially important fish species.
- · Conduct intermittent-flow fish respirometry on round goby.

2016 - 2017: Student collaborator, CIIMAR, University of Porto
- · Assisting on gene expression studies.

2015: Supervisor of ecological conditions, EDP (Portuguese energy supplier)
- · Ensuring favourable conditions to ichthyofauna during the construction phase of a hydropower dam.

2010 - 2016: Student assistant, Faculty of Sciences, University of Porto
- · Sampling of freshwater benthic macroinvertebrates.
- · Sampling of lenthic Ichthyofauna (electric fishing and net fishing).
- · Fish (F-IBIP) and macroinvertebrate (IBMWP, IBB) biotic index calculation.

Teaching Experience:

2022 & 2024:	Coordinator/Lecturer of BI358 - Animals: Form and function
2022 - 2024:	Coordinator of weekly study group "R hour"

Awarded grants:

Jan 2023: **[PI]** GLFC Sea lamprey control program grant (2023_FLA_541019)
"Physiological and behavioural effects of tagging post-metamorphic sea lamprey with a micro acoustic tag."
· Value: $151335 (CAD) over two years
· Host institution: Wilfrid Laurier University

Jan 2017: STSM Research Grant - COST Action CA15121
"The importance of hard-bottom reefs for fisheries and marine conservation"
· Value: €2400 (EUR)
· Location: Technical University of Denmark

2016: Merit Scholarship - University of Porto
· Value: €2525 (EUR)

Peer-reviewed works [n = 15]

Sortland, L. K., Wightman, G., **Flávio, H.**, Aarestrup, K., Roche, W. (2025). A Physical Bottleneck Increases Predation on Atlantic Salmon Smolts During Seaward Migration in an Irish Index River. Fisheries Management and Ecology, in press, e12779. doi: 10.1111/fme.12779

Casabona, E., Wilms, T., Moltesen, M., Bertelsen, J., M. Kruse, B., **Flávio, H.**, Holloway, P., Svendsen, J.C. (2024). Cobble reef restoration in the Baltic Sea: implications for life below water. *Aquatic Conservation: Marine and Freshwater Ecosystems*, 34(8), e4216. doi: 10.1002/aqc.4216

Flávio, H., Seitz, R.D., Eggleston, D.B., Svendsen, J.C., Støttrup, J.G. (2023). Hard-bottom habitats support commercially important fish species: A systematic review for the North Atlantic Ocean and Baltic Sea. *PeerJ*, 11, e14681. doi: 10.7717/peerj.14681

Baden, C., Christoffersen, M., **Flávio, H.**, Brown, E., Aarestrup, K., Svendsen, J.C. (2022) Using acoustic telemetry to locate flatfish spawning areas: Estuarine migrations of turbot *Scophthalmus maximus* and European flounder *Platichthys flesus*. *Journal of Sea Research*, 183, 102187. doi: 10.1016/j.seares.2022.102187

Gundelund, C., Arlinghaus, R., Birdsong, M., **Flávio, H.**, Skov, C. (2022) Investigating angler satisfaction: the relevance of catch, motives and contextual conditions. *Fisheries Research*, 250, 106294. doi: 10.1016/j.fishres.2022.106294

Jiménez-Mena, B., **Flávio, H.**, Henriques, R., Manuzzi, A., Ramos, M., Meldrup, D., Edson, J., Pálsson, S., Ólafsdóttir, G. A., Ovenden, J. R., Nielsen E. (2022) Fishing for DNA? Designing baits for population genetics in target enrichment experiments: guidelines, considerations and the new tool supeR-

baits. *Molecular Ecology Resources*. 22, 5, 2105-2119. doi: 10.1111/1755-0998.13598

Flávio, H., Baktoft, H. (2021) actel: Standardised analysis of acoustic telemetry data from animals moving through receiver arrays. *Methods in Ecology and Evolution*. 12, 196-203. doi: 10.1111/2041-210X.13503

Flávio, H., Caballero, P., Jepsen, N., Aarestrup, K. (2021). Atlantic salmon living on the edge: Smolt behaviour and survival during seaward migration in River Minho. *Ecology of Freshwater Fish*, 30(1), 61-72. doi: 10.1111/eff.12564

Niella. Y., **Flávio, H.**, Smoothey, A.F., Aarestrup, K., Taylor, M.D., Peddemors, V., Harcourt, R. (2020) Refined Shortest Paths (RSP): incorporation of topography in space use estimation from node-based telemetry data. *Methods in Ecology and Evolution*, 11(12), 1733-1742. doi: 10.1111/2041-210X.13484

Rhodes, N., Wilms, T., Baktoft, H., Ramm, G., Bertelsen, J.L., **Flávio, H.**, Støttrup, J.G., Kruse, B.M, Svendsen J.C. (2020). Comparing methodologies in marine habitat monitoring research: An assessment of species-habitat relationships as revealed by baited and unbaited remote underwater video systems. *Journal of Experimental Marine Biology and Ecology*, 526, 151315. doi: 10.1016/j.jembe.2020.151315

Flávio, H., Kennedy, R., Ensing, D., Jepsen, N., Aarestrup, K. (2020). Marine mortality in the river? Atlantic salmon smolts under high predation pressure in the last kilometres of a river monitored for stock assessment. *Fisheries Management and Ecology*, 27(1) 92-101. doi: 10.1111/FME.12405

Flávio, H., Aarestrup, K., Jepsen, N., Koed, A. (2019). Naturalised Atlantic salmon smolts are more likely to reach the sea than wild smolts in a lowland fjord. *River Research and Applications*, 35(3) 216-223. doi: 10.1002/rra.3400

Birnie-Gauvin, K., **Flávio, H.**, Kristensen, M.L., Rabideau, S.W., Cooke, S.J., Willmore, W.G., Koed, A., Aarestrup, A. (2019). Cortisol predicts migration timing and success in both Atlantic salmon and sea trout kelts. *Scientific Reports*, 9(1), 2422. doi: 10.1038/s41598-019-39153-x

Jepsen, N., **Flávio, H.**, Koed, A. (2019).The impact of Cormorant predation on Atlantic salmon and Sea trout smolt survival. *Fisheries Management and Ecology*, 26(2), 183-186. doi: 10.1111/fme.12329

Flávio, H.M., Ferreira, P., Formigo, N., Svendsen, J. (2017). Reconciling agriculture and stream restoration in Europe: a review relating to the EU Water Framework Directive. *Science of the Total Environment*, 596-597, 378-395. doi: 10.1016/j.scitotenv.2017.04.057

Talks, workshops, interviews, etc.:

Sep 2024: **[Workshop]** Comparing migration success between groups in acoustic telemetry studies
· Location: OTN workshop. Halifax, Canada.

Sep 2024: **[Talk]** Assembling a community-led framework for telemetry data analysis
· Location: OTN workshop. Halifax, Canada.

Jul 2023: **[Talk]** The importance of a broad thermal tolerance in the sea lamprey's successful invasion of the Laurentian Great Lakes

· Location: SEB Annual Conference. Edinburgh, Scotland.

[Poster] Exposure to an uncoupler of oxidative phosphorylation increases whole-animal consumption in the invasive larval sea lamprey

· Location: SEB Annual Conference. Edinburgh, Scotland.

May 2023: **[Talk]** The effect of Acclimation Temperature and TFM Concentration on the Oxygen Consumption of Larval Sea Lamprey

· Location: IAGLR's 66th Annual Conference on Great Lakes Research. Toronto, Canada.

Jan 2023: **[Talk]** Warmer water increases sea lamprey tolerance to TFM

· Location: 24th Sea Lamprey Annual Workshop. Green Bay, USA.

Nov 2022: **[Workshop]** Data management in acoustic telemetry

· Part 1: How to keep your data under control

· Part 2: Navigating an ocean of data

· Location: 2022 Ocean Tracking Network Symposium. Halifax, Canada.

[Poster] Acoustic Data Analysis, Simplified.

· Location: 2022 Ocean Tracking Network Symposium. Halifax, Canada.

Sep 2022: **[Interview]** Warming Waters Help Invasive Lamprey Survive Lampricide Treatments (Available online)

· Outlet: International Joint Commission Newsletter.

Jul 2022: **[Poster]** Acclimation temperature affects thermal performance in larval sea lamprey

· Location: SEB Annual Conference. Montpellier, France.

Jun 2022: **[Talk]** Larval sea lamprey don't mind the heat. Could tolerance to lampricides increase in warming climate?

· Location: International Conference on the Biology Fish. Montpellier, France.

May 2022: **[Talk]** Larval sea lamprey don't mind the heat. Could tolerance to lampricides increase in warming climate?

· Location: Joint Aquatic Sciences Meeting in Grand Rapids, Michigan, USA.

Nov 2021: **[Workshop]** Data Analysis Packages discussion panel (Available online)

· Location: Ocean Tracking Network (OTN) symposium, online.

Jan 2021: **[Workshop]** Standardized analyses of acoustic telemetry data using the R packages actel and RSP (Available online)

· Location: European Tracking Network (ETN), online.

2018: **[Interview]** (in Portuguese) Conheça o cientista português que estuda o salmão do Atlântico na Dinamarca (Available online)

· Outlet: Direção-Geral de Recursos Naturais, Segurança e Serviços Marítimos

Jul 2014: **[Talk]** Taxonomic standardisation of the benthic macroinvertebrate main sources for the calculation of the Portuguese official water quality indexes

· Location: XVII Congress of the Iberian Association of Limnology, Santander, Spain

Mentorship:

Undergrad Students [n = 5]

2024-01 - ...	**Oscar Notman** (On-going) - Dalhousie University Independent research project: Building and validating an intermittent-flow respirometry system.
2024-01 - 2024-04	**Alicia Balgobin** (Completed) - Wilfrid Laurier University Directed studies: Assessment of Temperature-Induced Genetic Damage in The Red Blood Cells of Lake Sturgeon (*Acipenser fluvescens*) Last known occupation: Undergraduate student, WLU.
2024-01 - 2024-04	**Aiden Seguin** (Completed) - Wilfrid Laurier University Directed studies: Thermal stress influence on the energetic capacity of tissue involved in locomotion and behavioral responses in lake sturgeon. Last known occupation: Research Assistance at Wilfrid Laurier University. Linkedin
2024-01 - 2024-04	**Vanessa Young** (Completed) - Wilfrid Laurier University Directed studies: Energetics of ionoregulatory and metabolic waste excretory tissues of juvenile lake sturgeon (*Acipenser fluvescens*) under thermal stress Last known occupation: Undergraduate student, WLU.
2022-07 - 2023-04	**Leonard D'Souza** (Completed) - Wilfrid Laurier University Honours thesis: The effect of 3-trifluoromethyl-4nitrophenol (TFM) on the oxygen consumption of larval sea lamprey (*Petromyzon marinus*) Last known occupation: Undergraduate student, WLU. Linkedin
2022-09 - 2022-12	**Wade Genter** (Completed) - Wilfrid Laurier University Directed studies: Feeding temporarily reduces brain water content in rainbow trout (*Oncorhynchus mykiss*) Last known occupation: Research Assistant at Ontario Aquaculture Research Centre. Linkedin

Master Students [n = 3]

2023 - ...	**Evan Bellhouse** (In progress) - Wilfrid Laurier University Thesis title (tentative): Metabolic costs of micro-acoustic tag implantation and burden in juvenile sea lamprey.
2023 - ...	**Julia Xeni** (in progress) - Wilfrid Laurier University Thesis title (tentative): Stress responses to tagging juvenile sea lamprey with a micro-acoustic tag.
2020 - 2021	**Olga Trela** (completed) - Technical University of Denmark (IMBRSea) Thesis title: Using fish telemetry to compare migration and survival of juvenile brown trout (*Salmo trutta*) released at different times of day into the Roskilde Fjord, Denmark.

Last known occupation: Aquatic Science Technician at Fisheries and Oceans Canada. Linkedin

Reviewed for:

· Aquatic Conservation: Marine and Freshwater Ecosystems
· Animal Biotelemetry
· Canadian Journal of Fisheries and Aquatic Sciences
· Freshwater Biology
· Fisheries Management and Ecology
· Fisheries Research
· Journal of Environmental Management
· Journal of Fish Biology

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