Jordanna N. Bergman | Curriculum Vitae

Department of Biology, Carleton University, Ottawa, Ontario, Canada
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EDUCATION

Carleton University, Ottawa, ON, CAN 2018-present
PhD Candidate in Biology
Thesis title: Investigating the ecological connectivity of Canada's historic Rideau Canal Waterway to inform conservation decisions
Advisors: Dr. Steven Cooke, Dr. Joseph Bennett

University of South Florida, Tampa, FL, USA 2010-2015
Bachelor of Science in Marine Biology
Advisor: Dr. Philip Motta
Minors: Geology, Environmental Policy

AWARDS & GRANTS

2021	Canadian Aquatic Resources Section of the American Fisheries Society Peter A. Larkin Award for Excellence in Fisheries (*Runner-up*, Honourary)
2021	Society for Conservation Biology Graduate Student Research Fellowship Award ($1,000)
2021	Muskies Canada Inc. Research Award (co-PI; $4,500)
2020-2023	NSERC Postgraduate Scholarships – Doctoral Program (PGS D) ($63,000)
2020-2021	Ontario Graduate Scholarship (declined; $15,000)
2020	Muskies Canada Inc. Research Award (co-PI; $6,150)
2020	American Fisheries Society (AFS) E.J. Crossman Award for Best Student Oral Presentation ($250)
2019-2020	NSERC Canada Graduate Scholarships – Master's Program (CGS M) ($17,500)
2019-2020	Carleton University Biology Department Award ($5,900)
2018-2019	Queen Elizabeth II Graduate Scholarship ($15,000)
2018-2019	Carleton University Biology Department Entrance & Award ($7,900)
2015	NSERC Undergraduate Student Research Award (USRA) ($7,000)
2011	Dean's Honour List (top 10%) (Honourary)
2010-2015	Florida Bright Futures Scholarship ($17,377)
2010-2013	University of South Florida Merit Scholarship ($8,154)

PEER-REVIEWED PUBLICATIONS

†indicates PhD thesis chapter

First-author publications

†**Bergman, J.N.,** Raby, G., Neigel, K., Balshine, S., Rennie, C., Bennett, J.R., Fisk, A., Cooke, S.J. (2022). Tracking the early stages of an invasion with biotelemetry: behaviour of round goby (*Neogobius melanostomus*) in Canada's historic Rideau Canal. *Biological Invasions*. https://doi.org/10.1007/s10530-021-02705-2

†**Bergman, J.N.,** Beaudoin, C., Mistry, I., Turcotte, A., Vis, C., Minelga, V., Neigel, K.L., Lin, H.-Y., Bennett, J.R., Young, N., *et al.* (2021). Historical, contemporary, and future perspectives on a

coupled social-ecological system in a changing world: Canada's historic Rideau Canal. e-First *Environmental Reviews*. https://doi.org/10.1139/er-2021-0026 (**selected as Editor's Choice)*.

Buxton, R.*, **Bergman, J.N.*,** Lin, H.-Y., Binley, A., Avery-Gomm, S., Schuster, R., Roche, D., Bennett, J. (2020). Three lessons conservation science can learn from the COVID-19 pandemic: A call to action from early career researchers. *Conservation Biology*. 34:1331-1332 *equal contributors. https://doi.org/10.1111/cobi.13652

Bergman, J.N.*, Binley, A.D.*, Murphy, R.E.*, Proctor, C.A.*, Nguyen, A.T.*, Urness, E.S.*, Vala, M.A.*, Vincent, J.G.*, Fahrig, L., Bennett, J.R. (2020). How to rescue Ontario's *Endangered Species Act*: A biologist's perspective. *FACETS*. 5: 423-431. *equal contributors. https://doi.org/10.1139/facets-2019-0050

Bergman, J.N., Bennett, J.R., Binley, A.D., Cooke, S.J., Vincent, F., Hlina, B.L., Reid, C.H., Vala, M.A., Madliger, C.L. (2019). Scaling from individual physiological measures to population-level demographic change: case studies and future directions for conservation management. *Biological Conservation.* 238: 108242. https://doi.org/10.1016/j.biocon.2019.108242

Bergman, J.N., Lajeunesse, M.J., Motta, P.J. (2017). Teeth penetration force of the tiger shark *Galeocerdo cuvier* and sandbar shark *Carcharhinus plumbeus*. *Journal of Fish Biology*. 91: 460-472. https://doi.org/10.1111/jfb.13351

Co-author publications

Twardek, W.M., Nyboer, E.A., Tickner, D., O'Connor, C.M., Lapointe, N.W.R., Taylor, M.K., Gregory-Eaves, I., Smol, J.P., Reid, A.J., Creed, I.F., Nguyen, V.M., Winegardner, A.K., **Bergman, J.N.,** *et al.* (2021). Mobilizing practitioners to support the Emergency Recovery Plan for freshwater biodiversity. *Conservation Science and Practice*, 3: e467. https://doi.org/10.1111/csp2.467

Cooke, S.J., **Bergman, J.N.,** Madliger, C.L., Cramp, R.L., Beardall, J., Burness, G., Clark, T.D., Dantzer, B., Barrera, E., Fangue, N.A., *et al.* (2021). One hundred research questions in conservation physiology for generating actionable evidence to inform conservation policy and practice. *Conservation Physiology*. 9(1): coab009. https://doi.org/10.1093/conphys/coab009

Cooke, S.J., Cramp, R.L., Madliger, C.L., **Bergman, J.N.,** Reeve, C., Rummer, J.L., Hultine, K.R., Fuller, A., French, S.S., Franklin, C.E. (2021). Conservation physiology and the COVID-19 pandemic. *Conservation Physiology*. 9: coaa139. https://doi.org/10.1093/conphys/coaa139

Cooke, S.J., Madliger, C.L., **Bergman, J.N.,** Nguyen, V.M., Landsman, S.J., Love, O.P., Rummer, J.L., Franklin, C.E. (2021). Optimism and opportunities for conservation physiology in the Anthropocene: a synthesis and conclusions. In Madliger, C.L., C.E. Franklin, O.P. Love, and S.J. Cooke (Eds.) *Conservation Physiology: Applications for wildlife conservation and management* pp. 319-329). Oxford University Press, UK.

Cooke, S.J., **Bergman, J.N.,** Nyboer E.A., Reid, A.J., Gallagher, A.J., Hammerschlag, N., Van de Riet, K., Vermaire, J.C. (2020). Overcoming the Concrete Conquest of Aquatic Ecosystems. *Biological Conservation*. 247: 108589. https://doi.org/10.1016/j.biocon.2020.108589

Krumhansl, K.A., **Bergman, J.N.,** Salomon, A.K. (2017). Assessing the ecosystem-level consequences of a small-scale artisanal kelp fishery within the context of climate-change. *Ecological Applications*. 27: 799-813. https://doi.org/10.1002/eap.1484

Publications in review, submitted, or in prep

Bergman, J.N., Buxton, R.T., Lin, H.-Y., Lenda, M., Hajdasz, A.C., Rivest, S.A., Nguyen, T.T., Cooke. S.J., Bennett, J.R. (accepted with minor revisions). The power of posting: evaluating the benefits and risks of social media for wildlife conservation. *FACETS*.

Bergman, J.N., Landsman, S., Negiel, K., Glassman, D., LaRochelle, L., Rennie, C., Bennet, J.R., Cooke, S.J. (in prep). Evaluating overwintering habitats of muskellunge in the Rideau Canal. Target journal: *Ecology of Freshwater Fish.*

Cooke, S.J., **Bergman, J.N.,** Twardek, W.M., Piczak, M.L., Casselberry, G.A., Lutek, K., Dahlmo, L.S., Birnie-Gauvin, K., Griffin, L.P., Brownscombe, J.W. (submitted). The movement ecology of fishes. *Biological Reviews*

Reid, J.,* **Bergman, J.N.,*** Kadykalo, A.,* Taylor, J., Twardek, W., Rytwinski, T., Chhor, A., Frempong-Manso, A., Martel, A., Lapointe, N., *et al.* (revised). Developing an Evidence-Based Toolbox for Addressing Freshwater Biodiversity Threats. *Biological Conservation.* *equal contributors.

Serving as **peer referee** for *ICES Journal of Marine Science, Journal of Fish Biology, Conservation Physiology, FACETS*

NON-PEER REVIEWED PUBLICATIONS

Bergman, J.N. (2021). What are the ecological impacts of winter water level drawdowns on muskellunge in Canada's historic Rideau Canal? Exploring winter connectivity and habitat use to inform conservation strategies. Muskies Canada Inc. LINK HERE

Bergman, J.N. (2021). SCB Member Spotlight: Jordanna Bergman. Write-up for winning the 2021 Society of Conservation Biology Graduate Student Research Fellowship. LINK HERE

Bennett, J., Cooke, S. (2021). Building evidence-based tools for biodiversity conservation. Report on G&C activities 2018-2021. Request PDF – my PhD thesis research is featured in this report.

Bergman, J.N., Cooke, S.J. (2020). Investigating fish connectivity in the Rideau Canal Waterway to inform conservation decisions. RAEON. LINK HERE

Bergman, J.N., Cooke, S.J. (2019). Tracking Fish in the Rideau Canal Waterway. Muskies Canada Release Journal, Research Special Issue, Vol. 42 No. 4. LINK HERE

Bergman, J.N. (2019). Stress Response of Sifakas to Seasonal Changes and Habitat Degradation: Things are Not What They Appear. Society for Experimental Biology Autumn Issue. LINK HERE

Bergman, J.N.*, Binley, A.D.*, Murphy, R.E.*, Proctor, C.A.*, Nguyen, A.T.*, Urness, E.S.*, Vala, M.A.*, Vincent, J.G.*, Fahrig, L., Bennett, J.R. (2019). Comment on the 10 Year Review of the Ontario Endangered Species Act. *authors contributed equally. Ontario Environmental Registry (request PDF).

Bergman, J.N. (2019). Fish Tagging in the Rideau Canal. Anglers Atlas (request PDF).

CONFERENCE PRESENTATIONS AND SEMINARS

(OP=oral presentation, PP=poster presentation)

Academic conferences and meetings

Bergman, J.N., Raby, G., Neigel, K., Balshine, S., Rennie, C., Bennett, J.R., Fisk, A., Cooke, S.J. (2021). Evaluating a round goby invasion with telemetry. The River Institute's 28th Annual River Symposium (*invited,* OP*).*

Beaudoin, C.,* **Bergman, J.N.,*** Mistry, I.* (2021). The patchwork governance of the Rideau Canal: Balancing usage priorities in a jurisdictional quagmire. Canadian Water Resources Association National Conference. Virtual meeting (*co-presented, OP).

Bergman, J.N., Negiel, K., Raby, G., Rennie, C., Bennet, J.R., Balshine, S., Cooke, S.J. (2021). Using biotelemetry to monitor an invasion front: investigating movement patterns and behaviour of round goby in the Rideau Canal. LOTEK Webinar Series (*invited*, OP).

Bergman, J.N., Neigel, K.L. (2021). How connected is the Rideau Canal? Using hydraulic models and acoustic telemetry to investigate fish connectivity and flooding. Third Annual NSERC Strategic Partnership Grant Meeting. Virtual Meeting (OP).

Bergman, J.N., Bennet, J.R., Cooke, S.J. (2021). Investigating the longitudinal connectivity of Canada's Rideau Canal Waterway to inform conservation decisions. Canadian Conference for Fisheries Research (CCFFR), Virtual Meeting (*invited,* OP).

Bergman, J.N., Buxton, R.T., Lin, H.-Y., Attinello, K., Hajdasz, A.C., Rivest, S.A., Nguyen, T.T., Cooke, S.J., Bennett., J.R. (2020). The power of posting: a review of the benefits and risks of social media for wildlife conservation. North American Congress for Conservation Biology (NACCB), Virtual Meeting (OP).

Bergman, J.N., Bennet, J.R., Cooke, S.J. (2020). Examining the ecological connectivity of the Rideau Canal Waterway as experienced by native and invasive fish. Great Lakes Acoustic Telemetry Observation System (GLATOS) Annual Meeting, Ann Arbor, MI, USA (OP).

Bergman, J.N., Bennet, J.R., Balshine, S., Raby, G., Cooke, S.J. (2020). Using acoustic telemetry to monitor an invasion front: investigating movement patterns and behaviour of round goby (*Neogobius melanostomus*) in the Rideau Canal Waterway. American Fisheries Society (Ontario Chapter) Annual Meeting, Orillia, ON, CAN (*awarded best student oral presentation*, OP).

Bergman, J.N. (2020). Identifying Canada's Information Needs – Meeting Biodiversity Conservation Targets. Workshop hosted by Carleton University/Environment and Climate Change Canada. Canadian Museum of Nature, Ottawa, ON, CAN (*invited*, rapporteur).

Bergman, J.N., Bennet, J.R., Cooke, S.J. (2020). Investigating the ecological connectivity of the Rideau Canal Waterway as experienced by native and invasive fish species. Second Annual NSERC Strategic Partnership Grant Meeting. Carleton University, Ottawa, ON, CAN (OP).

Bergman, J.N., Bennet, J.R., Cooke, S.J. (2018). Can selective fragmentation of Canada's Rideau Canal optimize conservation decisions? First Annual NSERC Strategic Partnership Grant Meeting. Carleton University, Ottawa, ON, CAN (OP).

Bergman, J.N., Heppell, S.A., Shea, C.P., Lowerre-Barbieri, S.K. (2017). Seasonal cycles of gonadal development and plasma sex steroid levels in the protogynous gag grouper *Mycteroperca microlepis*. American Fisheries Society Annual Meeting, Tampa, FL, USA (*invited*, OP).

Bergman, J.N., Lajeunesse, M., Motta, P. (2017). Teeth penetration force of the tiger shark *Galeocerdo cuvier* and sandbar shark *Carcharhinus plumbeus*. FISH, Ft. Lauderdale, FL, USA (OP).

Krumhansl, K.A., **Bergman, J.N.,** Salomon, A.K. (2015). Impacts of Giant Kelp Canopy Harvest on Temperate Reef Fish. Western Society of Naturalists, Sacramento, CA, USA (PP).

<u>Outreach and public lectures</u>

Bergman, J.N., Landsman, S., LaRochelle, L., Glassman, D., Cooke, S. (2021). Muskie Movement Ecology Study updates. Muskies Canada Ottawa Chapter, Virtual Meeting (*invited,* OP).

Bergman, J.N.,* Landsman, S.* (2021). Important Themes in Muskellunge Research – A Rideau River Context. Musky Trader Symposium (*co-presented, *invited,* OP).

Bergman, J.N., Landsman, S., Glassman, D., Cooke, S.J. (2020). How 'connected' is Canada's historic Rideau Canal Waterway? Muskies Canada Ottawa Chapter, Virtual Meeting (*invited,* OP).

Bergman, J.N. (2020). Integrating Ecological Connectivity into Management Strategies. Carleton University's Science Café Series, Ottawa, ON, CAN (*invited*, OP).

Bergman, J.N. (2019). Maintaining sustainable marine fisheries. Conservation Biology Course, Carleton University, Ottawa, ON, CAN (*invited*, OP).
Bergman, J.N., Bennet, J.R., Cooke, S.J. (2019). Investigating fish movements in the Rideau Canal to optimize conservation decisions. Big Rideau Lake Association, Portland, ON, CAN (*invited*, OP).
Bergman, J.N., Bennet, J.R., Cooke, S.J. (2019). Fish connectivity in the Rideau Canal. Rideau Canal Waterway Annual Meeting, Chaffey's Lock and Ottawa, ON, CAN (*invited*, OP).
Bergman, J.N., Motta, P.J. (2015). Shark conservation and changing public perception. The Great American Teach-In, Auburndale, FL, USA (*invited*, OP)

RESEARCH EXPERIENCE

PhD Candidate Fall 2018-present
Department of Biology, Carleton University, Ottawa, ON, CAN:
1) Thesis research: examine the spatial ecology of invasive and native fishes in the Rideau Canal to inform conservation decisions; tracking methods include acoustic telemetry and mark-recapture.
2) Serve as a teaching assistant and instructor for Department of Biology & Environmental Science courses: supervise, mentor, and assist students; support and/or lead field and lab work; provide engaging lectures.
3) Supervise and mentor undergraduate and graduate students: provide hands-on learning experiences including experimental design, boat handling, angling, electrofishing (boat, backpack), acoustic telemetry surgeries, receiver deployment & recovery, data collection & analysis, and proper fish handling techniques.
4) Grant manager: support NSERC grant management including coordinating annual meetings and writing final reports; create and submit yearly reports to OMNRF; coordinate meetings and documents for PIs across federal and academic institutions.

Biological Scientist II Fall 2015-Fall 2018
Marine Fisheries Research, Fish and Wildlife Research Institute, St. Petersburg, FL, USA:
1) Served as field Primary Investigator (PI) for the MARFIN Grant NA15NMF4330155 "Is low male abundance limiting stock productivity? Assessing factors affecting reproductive potential of gag grouper, *Mycteroperca microlepis*, in the Gulf of Mexico," and assist in all aspects of sample collection, data preparation, and final reports. *Sampling conducted via hook and line fishing 60-100 miles offshore year-round in the Gulf of Mexico.*
2) Led a physiology project to analyze sex hormones in blood plasma of sexually mature gag grouper to elucidate sex change, seasonal trends, and reproductive status in gag grouper.
3) Analyzed and managed all videos from an underwater videography array (~8000 hours) for species identification, abundance, and behavioural characteristics that may be related to spawning activities.
4) Served as an AAUS scientific diver (130-ft rating); conducted underwater surveys and gear service.

NSERC Undergraduate Student Research Award (USRA) Student Summer 2015
Coastal Marine Ecology & Conservation Laboratory, Simon Fraser University, Burnaby, BC, CAN:
1) Conducted research via dry suit diving in a remote coastal field setting off the Central Coast of British Columbia to investigate harvest impacts of surface canopy from giant kelp on local fish and invertebrate communities; published a scientific paper from this research in *Ecological Applications*.
2) Performed invertebrate belt transects for the annual Rocky Reef Monitoring Survey at Hakai Institute to investigate abundance, biomass, and biodiversity shifts with sea otter occupation time.
3) Collected and processed field data for measurements of kelp productivity and population dynamics.

4) Conducted tensile tests to measure biomechanical properties of giant kelp blades.

Undergraduate Research Student 2014-2015
Integrative Biology Laboratory, University of South Florida, Tampa, FL, USA:
Designed and implemented an independent research project examining tooth penetration force in carcharhinid sharks via biomechanical manipulations and highspeed videography analysis; published a scientific paper from this research in *Journal of Fish Biology*.

Research Volunteer Fall 2010, Summer 2011
South Florida/Caribbean Network (50 hours), National Park Service, Miami, FL, USA:
Assisted in research accuracy assessments of the marine benthic map for Biscayne National Park.

PROFESSIONAL HISTORY

AFS-OC Student Subunit Officers: Secretary Treasurer Fall 2021-present
The Ontario Chapter of the American Fisheries Society, based out of Ontario, CAN:

Animal Care Committee (ACC) Member Fall 2020-present
Carleton University, Ottawa, ON, CAN:
Ensure the ethical treatment of animals used for research, teaching, or display at Carleton University; provide feedback and input on protocols involving the use of animals.

Co-chair for The Ottawa-Carleton Institute of Biology Symposium Fall 2018-Spring 2019
Carleton University, Ottawa, ON, CAN:
Responsible for organizing all aspects of this non-profit conference including managing keynote speakers, funding sources, food and drink, the student poster session, oral presentations, and advertising.

PADI Open Water Scuba Instructor 2013-Present
Divemaster & Dive Trainer 2014-2015
Divemaster 2012-2014 (promoted)
Dive Operations, The Florida Aquarium, Tampa, FL:
1) Led dive experiences in the coral reef exhibit in close proximity to sharks, rays, and other aquatic organisms, and performed dive interpretive programs using a full-face mask scuba system.
2) Trained Dive Operations, Husbandry, and Volunteer divers in all aquarium diving and policies.
3) Organized orientations for the Dive with Sharks Program to discuss shark physiology, reproduction, ecology, and conservation.

The Florida Aquarium Husbandry Intern 2011-2012
Wetlands Team (400 service hours), The Florida Aquarium, Tampa, FL:
Monitored the safety and wellbeing of birds, reptiles, fish, rays, eels, and sharks, and served as a Water Quality Laboratory technician.

TEACHING

Instructor Fall Term 2021

Carleton University, Ottawa, ON, CAN:
Co-instructed the undergraduate course (42 students) *Introduction to Environmental Science* (ENSC 1500). Tasks included lecturing, mentoring, providing one-on-one support and guidance, and evaluating written assignments and oral presentations. We provided students with strategies for analyzing and solving the many interdisciplinary environmental problems that challenge our world today, focusing on training our next generation in reproducible research practices and science communication skills.

Teaching Assistant Fall 2018-present
Carleton University, Ottawa, ON, CAN:
Assisted in the instruction of Foundations of Biology I and II, Fish Ecology, and Herpetology; responsible for educating students in the theory and application of biological principles, experimental design, scientific writing, science communication, species identification, and statistical analyses.

Invited Lecturer Fall 2018 & 2019
Carleton University, Ottawa, ON, CAN:
Engaged 30 students in the *Environmental Science and Management: Theory and Practice* course (ENSC 3000) about agroecology and food production systems; organized off-campus educational trips to The Central Experimental Farm (Ottawa, ON), Roots and Shoots Farm (Alcove, QC), and Alska Farm (Low, QC) for hands-on experience with farmers, produce, and livestock.

Volunteer Laboratory Teaching Assistant Fall 2015
University of South Florida, Tampa, FL:
Assisted in the instruction of 'Fish Biology'; instructed students in learning internal and external anatomy, osteology, myology, taxonomy, and identification of fish; supported freshwater and marine collection trips.

MEDIA

Canadian Aquatic Resources Section of the American Fisheries Society Peter A. Larkin Award for Excellence in Fisheries: 2021 Larkin Award Results (08 Dec 2021).
Society for Conservation Biology: SCB Member Spotlight: Jordanna Bergman (27 Oct 2021). Personal interview after being selected for the SCB 2021 Graduate Student Research Fellowship.
CityTV: Goby fish invading Rideau Canal (15 July 2019). Personal interview for TV clip.
CFRA 580 News Talk Radio: live interview at 12:33 on round goby research in the Rideau Canal Waterway (July 13, 2019).
CBC News: Invasive round goby fish found in Rideau Canal (12 July 2019). Online article, radio broadcast of interview, and personal interview for TV clip.
Carleton Newsroom: Where The Wild Fish Go: Carleton students play pivotal role in Rideau waterway research (9 July 2019). Online article and personal interview.
CTV: personal interview and filming crew (26 June 2019).
TVO, Striking Balance. Multi-day filming crew, personal interview, documentary on Canada's 18 UNESCO-designated biosphere reserves (May 2019).

CERTIFICATIONS AND SKILLS

Scuba Diving: AAUS D130 Scientific Diver, CAUS Scientific Diver I, PADI Open Water Scuba Instructor, DUI Dry Suit Diver, NAUI Nitrox, Handicap Scuba Association Buddy, Dive Trainer for The Florida Aquarium, acoustic receiver deployment and retrieval

Computer Skills: R Statistical Analysis, Microsoft Office Suite, Compliance Suite, High speed and underwater videography analysis, SigmaPlot Version 12 Program, ArcGIS 10.3.1

Freshwater & Marine Field Skills: Ontario pleasure craft operator; boat handling and trailering; hook & line fishing (manual & electric); survey, monitor, and/or collect fishes, elasmobranchs, invertebrates, and kelps (canopy & understory) through belt transects, quadrats, and biomass & productivity surveys on snorkel and scuba; underwater navigation and mapping; diving: shore, spring, drift, deep, cavern, boat, exploratory, night and limited visibility, free diving

Laboratory Skills: enzyme-linked immunosorbent assay (EIA) kits, blood extraction and preparation from teleosts, otolith removal, gonad histology preparation and assessment, gross dissections (agnathans, frogs, salamanders, teleosts, elasmobranchs, cats), experimental design, light microscopy, DNA and RNA extraction, PCR, centrifuges, agarose gels, bacterial culture, titration

References

Dr. Philip Motta, Professor
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