

## Vita

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Universities Attended: Mount Allison University (2016)  
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### Publications / Conference Presentations:

Monk W.A., Compson Z.G., Choung C.B., Korbel K.L., Rideout N.K., Baird D.J. (2019) Urbanisation of floodplain ecosystems: Weight-of-evidence and network meta-analysis elucidate multiple stressor pathways. *Science of the Total Environment* 684, 741-752. <https://doi.org/10.1016/j.scitotenv.2019.02.253>

Van den Brink P.J., Bracewell S.A., Bush A., Chariton A., Choung C.B., Compson Z.G., Dafforn K.A., Korbel K., Lapen D.R., Mayer-Pinto M., Monk W.A., O'Brien A.L., Rideout N.K., Schäfer R.B., Sumon K.A., Verdonshot R.C.M., Baird D.J. (2019). Towards a general framework for the assessment of interactive effects of multiple stressors on aquatic ecosystems: Results from the Making Aquatic Ecosystems Great Again (MAEGA) workshop. *Science of the Total Environment* 684, 722-726. <https://doi.org/10.1016/j.scitotenv.2019.02.455>.

Rideout N.K., Compson Z.G., Monk W.A., Hajibabaei M., Baird D.J. (2019). Using traits to deconstruct linkages between macroinvertebrate diversity and wetland ecosystem function across a floodplain disturbance gradient. *Society for Freshwater Science Meeting, Salt Lake City, Utah, USA*. May 19 – 23.

Rideout N.K., Compson Z.G., Monk W.A., Stefani S., Hajibabaei M., Baird D.J. (2018). Using DNA-metabarcoding to link biodiversity and ecosystem function across a large-river floodplain disturbance gradient. *Society for Freshwater Science Meeting, Detroit, Michigan, USA*. May 20 – 24.

Rideout N.K., Compson Z.G., Monk W.A., Hajibabaei M., Baird D.J. (2018). The floodplain wetland puzzle: How DNA-metabarcoding plays an integral role in elucidating relationships between environmental drivers, invertebrate traits and ecosystem function. *Canadian Society for Ecology and Evolution Meeting, Fredericton, New Brunswick, Canada*. August 18 – 21.

Rideout N.K., Compson Z.G., Baird D.J. (2017). Picture perfect? Use of imaging software as a rapid tool for assessing community body size distribution of benthic macroinvertebrate samples. *Canadian Society for Ecology and Evolution Meeting, Victoria, British Columbia, Canada*. May 7 – 11.

Rideout N.K., (2016). Downstream effects of sedimentation change on wetland macroinvertebrate functional diversity. *13th Annual Canadian Rivers Institute Days, Quebec City, Quebec, Canada*. September 30 – October 1.

# Assessing the impacts of disturbance on a floodplain wetland complex: linking macroinvertebrate traits with ecosystem function

UNIVERSITY OF NEW BRUNSWICK

THESIS DEFENCE AND EXAMINATION

in Partial Fulfillment

of the Requirement for the Degree of  
Master of Science

by

**Natalie K. Rideout**

in the Department of Biology

U.N.B., Fredericton, N.B.

**Tuesday, December 17<sup>th</sup>, 2019  
10:00 a.m.**

Bailey Hall, Room 27

Examining Committee

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## Abstract

Floodplains are disturbance-driven ecosystems with high spatial and temporal habitat diversity, making them both highly productive and hosts to high biodiversity. The resulting habitat complexity arising from a diversity of disturbance regimes makes floodplains ideal ecosystems to examine interrelationships among biodiversity, biological traits and ecosystem function. Despite the rise in trait-based ecology, taxonomic resolution has imposed limitations, particularly in wetland and floodplain ecosystems where communities are vastly understudied compared to their riverine counterparts. This thesis describes the use of high-throughput genomic sequencing methods to reliably characterize community composition in the Grand Lake Meadows and Portobello Creek wetland complex, New Brunswick, Canada, in unprecedented detail. Overall, this thesis identified connectivity and hydrology as the driving forces in the formation of floodplain wetland habitat patches,

influencing historical shoreline change, temperature variation, nutrient and metal retention, macrophyte growth, and carbon storage. These habitat characteristics subsequently filtered for invertebrate traits, shaping the local community and thus ecosystem function. Healthy wetlands with higher primary productivity were associated with greater functional evenness, while habitat patches with increased decomposition rates had low richness, likely comprising highly disturbed habitat. In conclusion, this thesis highlights the importance of studying floodplain and wetland ecosystems as they contain linkages that are drastically different than their in-channel counterparts, and subsequently explores how to define ecosystem health in wetland habitats.