

Dr. David P. L. Toews
Curriculum Vitae

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The Pennsylvania State University
SC - Biology
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Education

Ph D, University of British Columbia, Department of Zoology, Vancouver, British Columbia, Canada, 2014.

Major: Zoology

MS, University of British Columbia, Department of Zoology, Vancouver, British Columbia, Canada, 2007.

Major: Zoology

BS, Acadia University, Wolfville, Nova Scotia, Canada, 2005.

Major: Biology

Professional Positions

Academic

Banting Postdoctoral Research Fellow, Cornell University. (September 2, 2016 - September 1, 2018).

Primarily independent research. Instructor of record for "Current Topics in Non-Model Genomics" (Cornell BioEE7600).

NSERC Postdoctoral Research Fellow, Cornell University. (September 1, 2014 - September 2, 2016).

Primarily independent research. Instructor of record for "Freshman Writing Seminar" (Cornell WRIT1430)

Government

Species at Risk Recovery Planning Coordinator, Environment Canada. (January 1, 2008 - May 1, 2009).

Liaison between federal government, provincial government, and species at risk recovery teams to facilitate review of recovery plans.

Professional Memberships

Elected Member, American Ornithological Society. (June 2019 - Present).

*See Honors or Awards for Scholarship, Research, or Creative Activities below.

Member, Society for the Study of Evolution. (May 2016 - Present).

Member, American Ornithologists Union. (June 2009 - May 2016).

Awards and Honors

Elective Member, American Ornithological Society. (June 2019).

Ned K. Johnson Early Investigator Award, American Ornithological Society. (May 2019).

Banting Postdoctoral Fellowship, Natural Sciences and Engineering Council of Canada (NSERC). (September 2016 - August 2018).

Postdoctoral Travel Award, American Ornithologists' Union. (August 2017).

Postdoctoral Fellowship, Natural Sciences and Engineering Council of Canada (NSERC). (September 2014 - August 2016).

Presentation Award, Society of Canadian Ornithologists. (August 2012).

Werner and Hildegard Hesse Fellowship in Ornithology, University of British Columbia. (August 2011 - August 2012).

Alexander Graham Bell Canadian Graduate Scholarship, Natural Sciences and Engineering Council of Canada (NSERC). (May 2009 - September 2011).

Young Explorers Grant, National Geographic Society. (May 2010).

McLean Fraser Summer Research Fellowship, University of British Columbia. (May 2009 - August 2009).

Canadian Graduate Scholarship, Natural Sciences and Engineering Council of Canada (NSERC). (May 2005 - September 2007).

Bill Hoar Award - Best Student Presentation, Canadian Society of Zoologists. (August 2005).

TEACHING

Teaching Experience

Penn State

BIOL 427, Evolution, 3 courses
BIOL 496, Indep Studies, 3 courses
BIOL 497, Special Topics, 1 course
BIOL 596, Indiv Studies, 4 courses
BIOL 600, Thesis Research, 3 courses

Non-Credit Instruction

Non-Credit Course, Co-Instructor, On-Line, Penn State Evolutionary Genomics Discussion Group, 20 participants, Internal to Penn State, Academic. Fall (September 2020 - Present). This journal discussion group will focus on the burgeoning literature on evolutionary genomics. Participants include undergraduates, graduate students, and postdocs. We meet weekly to discuss a new paper in the field. Co-taught with Dr. Marcella Baiz: <https://sites.google.com/view/psuevolutionarygenomics/home>

Guest Lecture, Guest Lecturer, On-Line, Genomics 551, Penn State, State College, 40 participants, Internal to Penn State, Academic. Fall (October 2020). Gave two 50-minute lectures to team-taught genomics class (Genomics 551).

Guest Lecture, Guest Lecturer, On-Line, Ornithology (BIOL 159), University of California - Riverside, Riverside, California, 20 participants, External to Penn State, Academic. Spring (May 2020).
Gave virtual 60-minute guest lecture for Ornithology Course (BIOL 169) for UC - Riverside.

Directed Student Learning

Juan Cerda, Penn State, Ph.D. Dissertation Committee Member (June 2020 - Present).

Alyssa Johnson, Penn State, Supervised Research (September 2019 - December 1, 2020).

Balaji Kumar, Penn State, Thesis Advising (September 2019 - Present).

Elyse McMahon, Penn State, Ph.D. Dissertation Committee Member (September 2019 - Present).

Cornelia Osborne, Penn State, Ph.D. Dissertation Committee Member (September 2020 - Present).

Lan-Nhi Phung, Penn State, Ph.D. Dissertation Advisor (September 2019 - Present).

Kathryn Stankiewicz, Penn State, Ph.D. Dissertation Committee Member (January 2020 - Present).

Stephanie Szarmach, Penn State, Ph.D. Dissertation Advisor (September 2020 - Present).

Dynisty Wright, Penn State, Ph.D. Dissertation Committee Member (May 2020 - Present).

RESEARCH

Intellectual Contributions

Articles Published in Refereed Journals

Szarmach, S. J., Brelsford, A., Witt, C. C., & Toews, David P. L. (Author) (2021). Comparing divergence landscapes from reduced-representation and whole genome resequencing in the yellow-rumped warbler (*Setophaga coronata*) species complex. *Molecular Ecology*. DOI: 10.1111/mec.15940, ISBN/ISSN: 0962-1083

Baiz, M. D., Wood, A. W., Brelsford, A., Lovette, I. J., & Toews, D. P. L. (Author, 60%) (2021). Pigmentation Genes Show Evidence of Repeated Divergence and Multiple Bouts of Introgression in *Setophaga* Warblers. *Current Biology*. DOI: 10.1016/j.cub.2020.10.094

Baiz, M. D., Wood, A. W., & Toews, David P. L. (Author) (2021). Rare hybrid solves "genetic problem" of linked plumage traits. *Ecology*. DOI: 10.1002/ecy.3424, ISBN/ISSN: 0012-9658

Wang, S., Ore, M. J., Mikkelsen, E. K., Lee-Yaw, J., Toews, David P. L. (Author), Rohwer, S., & Irwin, D. (2021). Signatures of mitonuclear coevolution in a warbler species complex. *Nature Communications*, 12(1). DOI: 10.1038/s41467-021-24586-8, ISBN/ISSN: 2041-1723

Baiz, M. D. (Author - Postdoctoral Student), Kramer, G. R., Streby, H. M., Taylor, S. A., Lovette, I. J., & Toews, D. P. L. (Author, 40%) (2020). Genomic and plumage variation in *Vermivora* hybrids. *The Auk: Ornithological Advances*, 137(3), ukaa027.

- Toews, D. P. L. (Author, 75%), Kramer, G. R., Jones, A. W., Brennan, C. L., Cloud, B. E., Andersen, D. E., Lovette, I. J., & Streby, H. (2020). Genomic identification of intergeneric hybrids in New World wood-warblers (Aves: Parulidae). *Biological Journal of the Linnean Society*, 131(1), 183-191.
- Wang, S., Rohwer, S., de Zwaan, D. R., Toews, D. P. L. (Author, 10%), Lovette, I. J., Mackenzie, J., & Irwin, D. (2020). Selection on a small genomic region underpins differentiation in multiple color traits between two warbler species. *Evolution Letters*, 4(6), 502-515. DOI: 10.1002/evl3.198
- Kim, K.-W., Jackson, B. C., Zhang, H., Toews, D. P. L. (Author, 10%), Taylor, S. A., Greig, E. I., Lovette, I. J., Liu, M. M., Davison, A., Griffith, S. C., Zeng, K., & Burke, T. (2019). Genetics and evidence for balancing selection of a sex-linked colour polymorphism in a songbird. *Nature Communications*, 10(1), 1852.
- Popovic, I., Toews, D. P. L. (Author, 40%), Keever, C. C., St. Clair, C. T., Barbaree, B. A., Guillermo, F., & Rourke, J. (2019). Genotyping-by-sequencing reveals genomic homogeneity among overwintering Pacific Dunlin (*Calidris alpina pacifica*) aggregations along the Pacific coast of North America. *The Condor: Ornithological Applications*, 121(3), duz036.
- Toews, D. P. L. (Author, 60%), Taylor, S. A., Streby, H. M., Kramer, G. R., & Lovette, I. J. (2019). Selection on VPS13A linked to migration in a songbird. *Proceedings of the National Academy of Sciences of the United States of America*, 116(37), 18272-18274.
- Irwin, D. E., Milá, B., Toews, D. P. L. (Author), Brelsford, A., Kenyon, H. L., Porter, A. N., Grossen, C., Delmore, K. E., Alcaide, M., & Irwin, J. H. (2018). A comparison of genomic islands of differentiation across three young avian species pairs. *Molecular Ecology*, 27(23), 4839--4855.
- Toews, D. P. L. (Author, 80%), Streby, H. M., Burket, L., & Taylor, S. A. (2018). A wood-warbler produced through both interspecific and intergeneric hybridization. *Biology Letters*, 14(11), 20180557.
- Cozzarolo, C.-S., Jenkins, T., Toews, D. P. L. (Author, 15%), Brelsford, A., & Christe, P. (2018). Prevalence and diversity of haemosporidian parasites in the yellow-rumped warbler hybrid zone. *Ecology and Evolution*, 8(19), 9834--9847.
- Toews, D. P. L. (Author, 75%), Lovette, I. J., Irwin, D. E., & Brelsford, A. (2018). Similar hybrid composition among different age and sex classes in the Myrtle--Audubon's warbler hybrid zone. *The Auk: Ornithological Advances*, 135(4), 1133--1145.
- Brelsford, A., Toews, D. P. L. (Author, 50%), & Irwin, D. E. (2017). Admixture mapping in a hybrid zone reveals loci associated with avian feather coloration. *Proceedings of the Royal Society B: Biological Sciences*, 284(1866), 20171106.
- Kenyon, H., Alcaide, M., Toews, D. P. L. (Author, 15%), & Irwin, D. (2017). Cultural isolation is greater than genetic isolation across an avian hybrid zone. *Journal of Evolutionary Biology*, 30(1), 81--95.
- Toews, D. P. L. (2017). Habitat suitability and the constraints of migration in New World warblers. *Journal of Avian Biology*, 48(12), 1614--1623.
- Toews, D. P. L. (Author, 60%), Heavyside, J. (Author - Undergraduate Student), & Irwin, D. E. (2017). Linking the wintering and breeding grounds of warblers along the Pacific Flyway. *Ecology and evolution*, 7(17), 6649--6658.

- Toews, D. P. L. (Author, 75%), Delmore, K. E., Osmond, M. M., Taylor, P. D., & Irwin, D. E. (2017). Migratory orientation in a narrow avian hybrid zone. *PeerJ*, 5, e3201.
- Toews, D. P. L. (Author, 50%), Hofmeister, N. R. (Author - Graduate Student), & Taylor, S. A. (2017). The evolution and genetics of carotenoid processing in animals. *Trends in Genetics*, 33(3), 171–182.
- Toews, D. P. L. (Author, 33%), Campagna, L., Taylor, S. A., Balakrishnan, C. N., Baldassarre, D. T., Deane-Coe, P. E., Harvey, M., Hooper, D. M., Irwin, D. E., Judy, C. D., Mason, N., McCormack, J., McCracken, K., Oliveros, C., Safran, R., Scordato, E., Stryjewski, K., Tigano, A., Uy, J. Albert, & Winger, B. (2016). Genomic approaches to understanding population divergence and speciation in birds. *The Auk: Ornithological Advances*, 133(1), 13–30.
- Toews, D. P. L. (Author, 80%), Brelsford, A., Grossen, C., Milá, B., & Irwin, D. E. (2016). Genomic variation across the Yellow-rumped Warbler species complex. *The Auk: Ornithological Advances*, 133(4), 698–717.
- Toews, D. P. L. (Author, 70%), Taylor, S. A., Vallender, R., Brelsford, A., Butcher, B. G., Messer, P. W., & Lovette, I. J. (2016). Plumage genes and little else distinguish the genomes of hybridizing warblers. *Current Biology*, 26(17), 2313–2318.
- Delmore, K. E., Toews, D. P. L. (Author, 15%), Germain, R. R., Owens, G. L., & Irwin, D. E. (2016). The genetics of seasonal migration and plumage color. *Current Biology*, 26(16), 2167–2173.
- Regan, M., Dhillon, R., Toews, D. P. L. (Author, 15%), Speers-Roesch, B., Sackville, M., Pinto, S., Bystriansky, J., & Scott, G. (2015). Biochemical correlates of aggressive behavior in the Siamese fighting fish. *Journal of Zoology*, 297(2), 99–107.
- Khadraoui, M. (Author - Undergraduate Student), & Toews, D. P. L. (Author, 50%) (2015). The influence of environmental cues and anthropogenic activity on roost departure times in the Northwestern crow (*Corvus caurinus*). *The Wilson Journal of Ornithology*, 127(4), 739–746.
- Toews, D. P. L. (2014). Biological species and taxonomic species: Will a new null hypothesis help?(A comment on Gill 2014). *The Auk: Ornithological Advances*, 132(1), 78–81.
- Toews, D. P. L. (Author, 60%), Brelsford, A., & Irwin, D. (2014). Isotopic variation across the Audubon's - myrtle warbler hybrid zone. *Journal of Evolutionary Biology*, 27(6), 1179–1191.
- Toews, D. P. L. (Author, 70%), Mandic, M., Richards, J. G., & Irwin, D. E. (2014). Migration, mitochondria, and the yellow-rumped warbler. *Evolution*, 68(1), 241–255.
- Safran, R., Flaxman, S., Kopp, M., Irwin, D. E., Briggs, D., Evans, M. R., Funk, W. C., Gray, D. A., Hebets, E. A., Seddon, N., Scordato, E., Symes, L., Tobias, J., Toews, D. P. L. (Author, 5%), & Uy, J. A. C. (2012). A robust new metric of phenotypic distance to estimate and compare multiple trait differences among populations. *Current Zoology*, 58(3), 426–439.
- Ilieva, M., Toews, D. P. L. (Author, 20%), Bensch, S., Sjöholm, C., & Åkesson, S. (2012). Autumn migratory orientation and displacement responses of two willow warbler subspecies (*Phylloscopus trochilus trochilus* and *P. t. acredula*) in South Sweden. *Behavioural processes*, 91(3), 253–261.
- Seneviratne, S. S., Toews, D. P. L. (Author, 10%), Brelsford, A., & Irwin, D. E. (2012). Concordance of genetic and phenotypic characters across a sapsucker hybrid zone. *Journal of Avian Biology*, 43(2), 119–130.

Toews, D. P. L. (Author, 50%), & Brelsford, A. (2012). The biogeography of mitochondrial and nuclear discordance in animals. *Molecular Ecology*, 21(16), 3907--3930.

Milá, B., Toews, D. P. L. (Author, 15%), Smith, T. B., & Wayne, R. K. (2011). A cryptic contact zone between divergent mitochondrial DNA lineages in southwestern North America supports past introgressive hybridization in the yellow-rumped warbler complex (Aves: *Dendroica coronata*). *Biological Journal of the Linnean Society*, 103(3), 696--706.

Kenyon, H. L. (Author - Undergraduate Student), Toews, D. P. L. (Author, 50%), & Irwin, D. E. (2011). Can song discriminate between MacGillivray's and Mourning warblers in a narrow hybrid zone? *The Condor*, 113(3), 655--663.

Toews, D. P. L. (Author, 80%), Brelsford, A., & Irwin, D. E. (2011). Hybridization between Townsend's *Dendroica townsendi* and black-throated green warblers *D. virens* in an avian suture zone. *Journal of Avian Biology*, 42(5), 434--446.

Irwin, D. E., Brelsford, A., Toews, D. P. L. (Author, 10%), MacDonald, C., & Phinney, M. (2009). Extensive hybridization in a contact zone between MacGillivray's warblers *Oporornis tolmiei* and mourning warblers *O. philadelphia* detected using molecular and morphological analyses. *Journal of Avian Biology*, 40(5), 539--552.

Toews, D. P. L. (Author), & Irwin, D. E. (2008). Cryptic speciation in a Holarctic passerine revealed by genetic and bioacoustic analyses. *Molecular Ecology*, 17(11), 2691--2705.

Parts of Books

Toews, D. P. L. (Author, 40%), Walsh, J., & Campagna, L. (2018). Population Genomics of Birds: Evolutionary History and Conservation. In Hohenlohe P.A., Rajora O.P. (Eds.), *Population Genomics: Wildlife* Springer, Cham.

Toews, D. P. L. (Author, 50%), & Irwin, D. E. (2012). Pacific Wren (*Troglodytes pacificus*). *The Birds of North America* Cornell Lab of Ornithology, Ithaca, NY. DOI: 10.2173/bow.pacwre1.01

Articles Published in Nonrefereed Journals

Toews, D. P. L. (Author, 50%), & Baiz, M. (Co-Author - Postdoctoral Student) (2020). Evolution: Speciation driven by migratory drop-off in flycatchers. *Current Biology*.

Toews, D. P. L. (2017). From song dialects to speciation in white-crowned sparrows. *Molecular Ecology*, 26(11), 2842--2844.

Toews, D. P. L. (2015). Evolution: a genomic guide to bird population history. *Current Biology*, 25(11), R465--R467.

Letter

Toews, David P. L. (Author), Baiz, M. D., Kramer, G. R., Lovette, I. J., Streby, H. M., & Taylor, S. A. (2021). "Extensive historical and contemporary hybridization suggests premating isolation in Vermivora warblers is not strong: A reply to Confer et al." *Ecology and Evolution*, 11(15), (pp. 10720-10723). DOI: 10.1002/ece3.7327, ISBN/ISSN: 2045-7758

MSc. Thesis

Toews, D. P. L. (2007). Reproductive isolation in a contact zone between divergent forms of winter wren (*Troglodytes troglodytes*). University of British Columbia.

Ph.D. Thesis

Toews, D. P. L. (2014). Hybridization, speciation and the biogeography of genetic and phenotypic variation in Setophaga warblers. University of British Columbia.

Peer Reviewer of Grant Proposals, Manuscripts, Etc.

Ibis, Reviewer. (December 2020). 1 review(s).

PLoS Genetics, Reviewer. (December 2020). 1 review(s).

Proceedings of the National Academy of Sciences, Reviewer. (November 2020). 1 review(s).

Molecular Ecology, Reviewer. (October 2019 - November 2020). 3 review(s).

The Auk: Ornithological Advances, Reviewer. (February 2019 - October 2020). 3 review(s).

Biological Journal of the Linnean Society, Reviewer. (August 2020). 1 review(s).

Nature Communications, Reviewer. (September 2019 - August 2020). 2 review(s).

Evolution, Reviewer. (March 2019 - July 2020). 3 review(s).

G3: Genes, Genomes, Genetics, Reviewer. (June 2020). 1 review(s).

American Naturalist, Reviewer. (March 2020). 1 review(s).

Current Biology, Reviewer. (October 2019 - March 2020). 3 review(s).

Science, Reviewer. (February 2020). 1 review(s).

Ecography, Reviewer. (January 2020). 1 review(s).

Journal of Experimental Zoology, Reviewer. (December 2019). 1 review(s).

Molecular Biology and Evolution, Reviewer. (December 2019). 1 review(s).

Genome Biology, Reviewer. (October 2019). 1 review(s).

Journal of Avian Biology, Reviewer. (July 2019). 1 review(s).

Molecular Ecology Resources, Reviewer. (May 2019). 1 review(s).

Proceedings of the Royal Society B: Biological Sciences, Reviewer. (May 2019). 1 review(s).

Journal of Evolutionary Biology, Reviewer. (March 2019). 1 review(s).

The Condor - Ornithological Applications, Reviewer. (February 2019). 1 review(s).

Presentations Given

Toews, D., Wood, A., Welch, A., Fleischer, R., Dale, A., & Miller, E. (August 2020). "Diet Variation in a Diverse Community of Wood Warblers Revealed by Meta-Barcoding," North American Ornithological Conference, Puerto Rico, USA (Virtual), 100 in attendance, Invited.

- Toews, D. (February 2020). "Hybridization Reveals the Genes for Color and Migration in an Avian Radiation," 2020 Program in Ecology symposium, Program in Ecology University of Wyoming, Laramie, Wyoming, USA, 200 in attendance.
- Toews, D. (November 2019). "Hybridization reveals the genes for color and migration in an avian radiation," Weekly, Penn State Ecology Program, State College, Pennsylvania, USA, 60 in attendance, Invited. Universities.
- Toews, D. (November 2019). "Mistakes Happen! Hybridization in Wood Warblers," State College Bird Club Monthly Meeting, State College Bird Club, State College, 40 in attendance, Invited. Local.
- Toews, D. (September 2019). "Mistakes Happen! Hybridization in wood warblers," Pennsylvania Society for Ornithology Annual Meeting, Pennsylvania Society for Ornithology, Williamsport, PA, 100 in attendance, Invited.
- Toews, D. (September 2019). Invited Departmental Seminar (declined), Auburn University Department of Biological Sciences, Auburn, AL, Invited. Universities.
- Toews, D. (June 2019). "A history of hybridization in wood warblers," American Ornithological Society, American Ornithological Society, Anchorage, AK, 200 in attendance, Invited. International.
- Toews, D., Streby, H., Kramer, G., Taylor, S., & Lovette, I. (June 2019). "Selection on VPS13A linked to long-distance migratory behavior in a songbird," American Ornithological Society, American Ornithological Society, Anchorage, AK, 75 in attendance, Invited. Universities.
- Toews, D. (April 2019). "The Genomic Consequences of Hybridization," Departmental Seminar, Penn State - Bioinformatics and Genomics program, State College, Pennsylvania, USA, 75 in attendance, Invited. Universities.
- Toews, D. (March 2019). "Ancient and contemporary hybridization among wood warblers," Gordon Speciation Conference, Gordon Research Conferences, Ventura, CA, 50 in attendance, Contributed. Universities.
- Toews, D. (March 2019). "Hybridization reveals the genes for color and migration in an avian radiation," Invited Departmental Seminar, Department of Biology - Villanova University, Philadelphia, PA, 75 in attendance, Invited. Universities.
- Toews, D. (February 2019). "Find your partner: hybridization in wood warblers," Cayuga Bird Club Monthly Meeting, Cayuga Bird Club, Ithaca, NY, 100 in attendance, Invited.
- Toews, D., Streby, H., Kramer, G., Taylor, S., & Lovette, I. (August 2018). "Population genomics of *Vermivora* warblers," Annual Meeting, International Ornithological Congress, Vancouver, British Columbia, Canada, 100 in attendance, Contributed. International.
- Toews, D. (March 2018). "Hybridization reveals the genes for migratory behavior and color in an avian radiation," Departmental Seminar, Harvard University - Museum of Comparative Zoology, Cambridge, Massachusetts, USA, 50 in attendance, Invited. Universities.
- Toews, D. (January 2018). "Hybridization reveals the genes for migratory behavior and color in an avian radiation," Departmental Seminar, Cornell University - Department of Ecology and Evolution, Ithaca, New York, USA, 75 in attendance, Invited. Universities.

- Toews, D., Heavyside, J., & Irwin, D. (July 2017). "The evolution and constraints of migration in wood warblers," Annual Meeting, American Ornithological Society, East Lansing, Michigan, USA, 100 in attendance, Contributed. International.
- Toews, D. (June 2017). "How hybridization structures the genomes of related birds," Annual Meeting - Invited Spotlight Sessions, Society for Study of Evolution, Portland, Oregon, USA, 150 in attendance, Invited. International.
- Toews, D. (June 2017). "The empirical and rhetorical extremes of mitochondrial and nuclear discordance," Annual Meeting, Society for Study of Evolution, Portland, Oregon, USA, 50 in attendance, Contributed. International.
- Toews, D. (March 2017). "Warbler genes: what does hybridization tell us?," Massachusetts Audubon, Boston, Massachusetts, USA, 200 in attendance, Invited. Regional.
- Toews, D. (March 2017). "The genetics of plumage colouration and species formation in wood warblers," Departmental Seminar, Trent University - Forensic Science & Environmental Life Sciences Department, Peterborough, Ontario, Canada, 75 in attendance, Invited. Universities.
- Toews, D. (February 2017). "The genetics of plumage colouration and species formation in wood warblers," Annual Conference, Gordon Speciation Conference, Lucca, Italy, 150 in attendance, Invited. International.
- Toews, D., Taylor, S., Vallender, R., Butcher, B., Brelsford, A., Messer, P., & Lovette, I. (October 2016). "Plumage genes and little else distinguish the genomes of hybridizing warblers," Graduate Invited Speaker, Smithsonian Conservation Biology Institute, Washington, DC, USA, 60 in attendance, Invited. Institutes.
- Toews, D., Taylor, S., Vallender, R., Butcher, B., Brelsford, A., Messer, P., & Lovette, I. (September 2016). "Plumage genes and little else distinguish the genomes of hybridizing golden-winged and blue-winged warblers," Annual Meeting, North America Ornithological Conference, Washington, DC, USA, 150 in attendance, Contributed. International.
- Toews, D., Taylor, S., Vallender, R., Butcher, B., Brelsford, A., Messer, P., & Lovette, I. (June 2016). "Plumage genes and little else distinguish the genomes of hybridizing golden-winged and blue-winged warblers," Annual Meeting, Society for Study of Evolution, Austin, Texas, USA, 100 in attendance, Contributed. International.
- Toews, D. (November 2015). "A long history of hybridization reveals candidate genes underlying the plumage differences between golden-winged and blue-winged warblers," Department, Institut de Biologie Intégrative et des Systèmes, Université Laval, Québec, Québec, Canada, 50 in attendance, Invited. Institutes.
- Toews, D., Taylor, S., Butcher, B., Vallender, R., & Lovette, I. (August 2015). "Extensive biogeographic introgression and weak genomic differentiation between phenotypically distinct wood warblers," Annual Meeting, American Ornithologists' Union, Norman, Oklahoma, USA, 100 in attendance, Contributed. National.
- Toews, D., & Brelsford, A. (June 2015). "The genomic consequences of divergence and hybridization in a migratory wood warbler," Annual Meeting, Society for Study of Evolution, Guarujá, São Paulo, Brazil, 75 in attendance, Contributed. International.
- Toews, D. (February 2015). "The genomic consequences of divergence and hybridization in birds," Darwin Day Lecture, DePaul University, Chicago, Illinois, USA, 100 in attendance, Invited. Universities.

- Toews, D., Brelsford, A., Grossen, C., Mila, B., & Irwin, D. (September 2014). "Genomic variation in yellow-rumped warbler," Annual Meeting, American Ornithologists' Union, Estes Park, Colorado, USA, 150 in attendance, Invited. National.
- Toews, D., Brelsford, A., Grossen, C., Mila, B., & Irwin, D. (May 2014). "Genomic variation in yellow-rumped warbler," Annual Meeting, Canadian Society of Ecology and Evolution, Montreal, Quebec, Canada, 150 in attendance, Contributed. National.
- Toews, D., Mandic, M., Richards, J., & Irwin, D. (August 2012). "Migration, mitochondria, and the yellow-rumped warbler," Annual Meeting, North America Ornithological Conference, Vancouver, British Columbia, Canada, 100 in attendance, Contributed. International.
- Toews, D., Mandix, M., Richards, J., & Irwin, D. (July 2012). "Introgression and the yellow-rumped warbler: can variation in migratory behaviour explain differences in mitochondrial genotype and phenotype in a cryptic hybrid zone," Annual, Joint Congress on Evolutionary Biology, Ottawa, Ontario, Canada, 200 in attendance, Contributed. International.
- Toews, D., & Irwin, D. (October 2011). "Seasonal migration and genetic differentiation: studies of avian contact zones in Western Canada," Annual Meeting, Canadian Migration Monitoring Network, Naramata, British Columbia, Canada, 75 in attendance, Invited. National.
- Toews, D., Mila, B., Brelsford, A., & Irwin, D. (May 2011). "Introgression and hybridization in the yellow-rumped warbler (*Dendroica coronata*) species complex," Annual Meeting, 100 in attendance, Contributed. National.
- Toews, D., Brelsford, A., & Irwin, D. (July 2009). "Discovery of a Hybrid Zone Between Townsend's (*Dendroica townsendi*) and Black throated Green (*D. virens*) Warblers," Annual Meeting, American Ornithologists' Union, Philadelphia, Pennsylvania, USA, 100 in attendance, Contributed. International.
- Toews, D., & Irwin, D. (April 2009). "Caught in the middle: East-West avian contact zones in B.C.," Western Working Group Meeting, Partners in Flight, Penticton, British Columbia, Canada, 75 in attendance, Invited. International.
- Toews, D. (May 2008). "From coast to coast: testudines to passerines, a slice of evolution in action," Keith Porer Memorial Lecture, Acadia University, 100 in attendance, Invited. Universities.
- Toews, D., & Irwin, D. (May 2007). "Genetic and bioacoustic analysis of cryptic speciation in a holarctic passerine," Annual Meeting, Canadian Society of Zoologists, Montreal, Quebec, Canada, 150 in attendance, Contributed. National.
- Toews, D., & Irwin, D. (May 2006). "Bioacoustic analysis of cryptic speciation of a holarctic passerine," Annual Meeting, Canadian Society of Zoologists, Edmonton, Alberta, Canada, 150 in attendance, Contributed. National.

Contracts, Grants, and Sponsored Research

Grant

- Avery, J. D. (Principal Investigator), Toews, D. (Co-Investigator), Grant, 50% credit, "Characterization of ruffed grouse (*Bonasa umbellus*) population genetic structure and diversity in Pennsylvania: management and conservation implications," COP: Game Commission, Commonwealth of Pennsylvania. Total requested: \$260,081.00, Total Anticipated: \$260081, Amount Funded (Total or To Date, as applicable): \$260081.

(submitted: August 24, 2020, date funding awarded: December 10, 2020, total start and end of funding: December 9, 2020 - June 30, 2023).

Toews, D. (Principal Investigator), Grant, 100% credit, "Canada 150 Sequencing Initiative - Canada warbler genome sequencing," CanSeq, Foreign Governments and International Agencies. Total requested: \$2,010.00, Amount Funded (Total or To Date, as applicable): \$2010. (submitted: January 2019, date funding awarded: February 2019).

Other

Toews, D. (Principal Investigator), 100% credit, "Hotspots of Genome Evolution in a Rapid Vertebrate Radiation," National Science Foundation, Federal Agencies. Total requested: \$1,129,575.00, Total Anticipated: \$0, Amount Funded (Total or To Date, as applicable): \$0. (submitted: April 27, 2021).

Toews, D. P. L. (Co-Principal Investigator), Miller, E. (Co-Principal Investigator), Webster, M. (Principal Investigator), "Insect Invaders of New York's Forests (Hatch Grant)," United States Department of Agriculture, Federal Agencies. Total requested: \$105,000.00, Total Anticipated: \$105,000. (submitted: December 2019, date not funded: September 21, 2020).

Development Activities Attended

"Culturally Aware Mentoring," National Research Mentoring Network, Diversity Program Consortium - NIH, 10 credit hours. (October 29, 2020 - November 12, 2020).

"Safer People Safer Places: Foundations," Center for Sexual and Gender Diversity, 3 credit hours. (September 2020).

"Safer People Safer Places: Transgender and Gender Inclusion 101," Center for Sexual and Gender Diversity, 3 credit hours. (April 2020).

"Mentoring Matters: Training Mentors in STEM," Eberly College of Science, 8 credit hours. (June 2019).

SERVICE

Service to the University

Campus

Committee Work

Institute for Computational and Data Sciences Seed Grant 2020-21, Reviewer. (February 2020).
Reviewed seed grant proposals.

College

Committee Work

Computation, Bioinformatics and Statistics (CBIOS) Predoctoral Training Grant Selection Committee, Evaluator. (May 2020).
Each calendar year, 4 students (NIH + PSU supported) are admitted to the training. I participated in reviewing the student applicant materials, as well as participated in live

interviews with each candidate.
Selected four student to receive the training position.

Department

Committee Work

Biology Student Awards Committee, Evaluator. (May 2020).
Reviewed student statements and records to determine rankings for financial awards.

Participation in Recruitment and Retention Activities

(June 2019 - Present).
Recruited three visible minority students or postdocs to perform independent research in my lab, and have recruited three women at the graduate/postdoc level to my group.

Division

Committee Work

Intercollege Graduate Degree Program in Ecology, Member. (October 2019 - Present).
- Attend seminar and student recruitment events.
- Gave seminar about research.
- Served as faculty judge for colloquium talks.

Bioinformatics & Genomics Program, Faculty. (September 2019 - Present).
- Attend weekly seminars.
- Gave research seminar.
- Student recruitment activities.

Ecology Qualifying Exam Committee, Evaluator. (November 2020).
Wrote questions for exam and evaluated written qualifying exams. Also participated in live qualifying exams for 4 students.

Service to Society as a Representative of the University

Organizing Conferences and Service on Conference Committees

North American Ornithological Conference, Symposium Organizer: "Studies of avian radiations in the 21st century", International. Puerto Rico / COVID Virtual USA. (August 2020).

Service to Public and Private Organizations

North American Ornithological Conference, Judge. (August 2020).
Judge for student presentations and posters.

American Ornithological Society, Mentor. Anchorage, Alaska. (2019).
Academic Mentor for students paired during the annual society meeting.

American Ornithological Society, Judge. (August 2015 - August 2019).
Judge for student presentations and posters.

Service to the Disciplines and to the Profession

Service to Governmental Agencies

Committee on the Status of Endangered Wildlife in Canada, Birds Specialist Subcommittee, Committee Member, Elected. Canada. (January 1, 2018 - January 1, 2022).

Review species status report. Provide insight on population genetics. Attend annual subcommittee meeting.

National Science Foundation, Division of Environmental Biology, Reviewer. (September 2020).

Ad-hoc reviewer for CAREER grant.

National Science Foundation, Division of Environmental Biology, Reviewer. (September 2019).

Ad-hoc reviewer for CAREER grant.

Natural Sciences and Engineering Research Council of Canada, Reviewer. (February 2019).

Reviewed NSERC "Discovery" grant.