

Sean M Hoban

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Education

University of Notre Dame	PhD Biology	May 2010
Bellarmino University	B.A. Biology, magna cum laude	May 2005

Appointments

Postdoctoral Research. (July 2010- present) Co-Advisors: Dr. Oscar Gaggiotti & Giorgio Bertorelle
“[Conservation of genetic resources for effective species survival](#)”

- Evaluation and improvement of population genetic simulation tools for conservation management
- Design and programming of pipelines for population genetic simulation and analysis tools
- Liaise with a graphical software design team to display output from these tools
- Integrate pipelines with an online database and tool collection developed at 13 partner institutions
- Develop software user manuals targeted at non-genetics experts
- Present software to user groups, including policy makers, conservation biologists, wildlife managers, population geneticists and NGOs; solicit feedback and make improvements

Graduate Research. (August 2005- May 2010) Advisor: Dr. Jeanne Romero-Severson
“[Natural and anthropogenic influences on populations dynamics of a rare forest tree](#)”

- Designed and optimized cross-species nuclear microsatellite primers; assisted in development of species specific chloroplast CAPS markers
- Utilized these markers for analysis of gene flow and interspecific hybridization
- Performed field collections in the United States and Canada; co-ordinated sample collection with collaborators at partner institutions including botanic gardens and the Forest Service
- Trained and supervised undergraduate research assistants
- Built upon network of collaborators for conservation and germplasm improvement
- Authored two research grant proposals, one of which was funded

Undergraduate Research. (November 2004- May 2005) Advisor: Dr. Thomas Bennett
“The influence of Circadian rhythm and exercise on IgA and cortisol in humans”

- Designed and performed ELISA experiments to measure immune response to exercise
- Created a human subject informed consent form and recruited volunteers

Undergraduate Research Assistant. (June- August 2002) Advisor: Dr. Eric Wong
“Isolating the ephrin A5 signal pathway in chick embryo”

- Used affinity column chromatography to isolate unknown regulatory molecules, and gel electrophoresis to separate and attempt to identify these unknown proteins

Peer Reviewed Publications

Hoban S, G Bertorelle, and O Gaggiotti (in prep) A review of population genetic simulators for practical use in ecology and evolutionary biology
Borkowski D, S Hoban, T McCleary, and J Romero-Severson (in prep) Fine-scale genetic structure and differentiation in an island population of red oak (*Quercus rubra* L.), a wind-pollinated forest tree
Hoban S and J Romero-Severson (in prep) Parental contribution to a small patch of regenerating *Juglans cinerea*, a temperate forest tree: reproductive dominance by few parents
Hoban S and J Romero-Severson (in review) Homonymy, synonymy and hybrid misassignment in butternut (*Juglans cinerea*) and Japanese Walnut (*Juglans ailantifolia*) Cultivars
Hoban S and J Romero-Severson (in revision) Human impacted landscapes facilitate hybridization between a native and an introduced tree species

- Hoban S, S Schlarbaum, T McCleary, J Romero-Severson (in revision) Spatial genetic structure influenced by topography and population demography in butternut (*Juglans cinerea* L)
- Hoban S and J Romero-Severson (2011) [Challenging a 'Why should I care' attitude by incorporating societal issues in the classroom](#) *American Biology Teacher* 73 (1)
- Hoban S, D Borkowski, S Brosi, T McCleary, L Thompson, J McLachlan, M Pereira, S Schlarbaum, and J Romero-Severson (2010) [Range wide population differentiation in *Juglans cinerea*: a product of both historical range shifts and ecological marginality](#) *Molecular Ecology* 19 (22) p4876- 4891
- Hoban, S, T McCleary, S Schlarbaum, and J Romero-Severson (2009) [Geographically extensive hybridization between the forest trees American butternut and Japanese walnut](#) *Biology Letters* 5 (3) p324-327
- Hoban, S, R Anderson, T McCleary, S Schlarbaum, and J Romero-Severson (2008) [Thirteen nuclear microsatellite loci for butternut](#) (*Juglans cinerea* L) *Molecular Ecology Resources* 8 (3) p643-646

Non Peer Reviewed Publications

- Hoban S and J Romero-Severson (in prep) Correct identification of cultivars of butternut and heartnut, and implications for nut tree improvement *The Nutshell, the quarterly newsletter of the Northern Nut Growers Association*
- Hoban, S (2009) Book review of "An Introduction to Plant Breeding" by Jack Brown and Peter Caligari *Plant Science Bulletin* 55(4) p171-172
- Hoban, S and D Borkowski (2009) [Book review of "Wildflowers of Wisconsin and the Great Lakes Region"](#) by Emmet Judziewicz and Merel Black *Plant Science Bulletin* 55(4) p177-178
- Hoban, S (2009) [Book review of "Plants and Vegetation: Origins, Processes, Consequences"](#) by Paul Keddy *Plant Science Bulletin* 55(1) p32-33
- Hoban, S (2008) [Butternuts, hybrids, and butternut canker: current and future research](#) *The Nutshell, the quarterly newsletter of the Northern Nut Growers Association* 62(4) p14-16

Professional Presentations (** = co-author but not attendee)

- Annual Meeting of the Northern Nut Growers Association. Logan, UT, 2011**
"Synonomies, homonymies and hybrids in butternut and chestnut cultivars"
- Schatz Tree Genetics Colloquium: Genetics, ecology, and management of walnuts & butternut. Penn State Mont Alto Campus, PA, 2011**
"A long term strategy for combating exotic pests in butternuts"
- Laboratoire d' Ecologie Alpine. Grenoble, France, 2011 (journée des doctorants et postdoctorants)
"Anthropogenic landscapes associated with interspecific hybridization"
- Laboratoire d' Ecologie Alpine. Grenoble, France, 2011 (invited departmental seminar)
"Natural and anthropogenic influences on population genetics in butternut"
- Population Genetics Group Meeting. Hull, UK, 2011
"Human impacted landscapes facilitate hybridization between a native and an introduced tree"
- University of Notre Dame Graduate Research Symposium. Notre Dame, IN, 2010 (poster)
"The role of historical and contemporary ecology in shaping distribution of genetic diversity"
- University of Notre Dame Graduate Student Seminar. Notre Dame, IN, 2010
"Seed dispersal in Riparian vs. Upland sites"
- Annual Meeting of the Northern Nut Growers Association. West Lafayette, IN, 2009**
"Cultivar Fingerprinting"
"Butternuts, heartnuts and hybrids"
- University of Notre Dame Graduate Student Seminar. Notre Dame, IN, 2009
"Using genetics to set conservation priorities for butternut, a threatened forest tree"
- Plant Biology. Honolulu, HI, 2009 (poster)
"Extensive natural hybridization between butternut and the introduced tree Japanese walnut"
- Annual Meeting of the Northern Nut Growers Association. College Station, TX, 2008
"Technical presentation: Genetic tools for nut growers"
- Evolution. Minneapolis, MN, 2008
"Introgression or isolation? Hybridization between native and introduced forest trees"

- University of Notre Dame Graduate Student Seminar. Notre Dame, IN, 2008
“Hybridization or isolation: when allopatric species are reunited.”
- University of Notre Dame, Undergraduate Student Research Symposium, Notre Dame, IN, 2007
“Invasive species, hybrids, and consequences”
- Annual Meeting of the Northern Nut Growers Association. Ottawa, ON. 2007
“Research update: Conservation genetics of butternut”
- Botany and Plant Biology. Chicago, IL, 2007
“Genetic introgression: the invasion you don’t see”
- Midwest Ecology and Evolution Conference. Kent State, OH, 2007
“Using molecular tools to save the butternut tree”
- Butler University Undergraduate Research Conference. Indianapolis, IN, 2005 (poster)
“The influence of circadian rhythm and exercise on IgA and cortisol in humans.”

Skills

- Population genetic analysis:
 - Expertise in: Arlequin (including arlecore), BAPS, Bottleneck, Cervus, Fstat, GeneAIEx, GeneMapper, Genepop, Migrate, NewHybrids, SimCoal, Spagedi, Structure
 - Working knowledge of Barrier, EasyPop, GDA, Geneland, GeneClass, Geste, Parentage, MsVar, Rmetasim, Tess
 - Beginner knowledge of: Bayescan, LDNe, Powermarker, RxC
- Population genetic simulation:
 - Expertise in: HybridLab, Simcoal/ Simcoal2, RmetaSim
 - Beginner knowledge of Vortex, KernelPop, EasyPop, ms, Pedagog
- Molecular biology lab techniques including: PCR, gel electrophoresis, restriction, primer design and optimization, DNA extraction, genotyping, cell culture
- Field skills: collection trip planning, compass and map reading, GPS
- Computer programming: intermediate level Java, including graphical programming; basic C; intermediate level R; beginner Python
- General biostatistical knowledge
- Other:
 - Expertise in Microsoft Office suite, especially Excel, Word
 - Working knowledge of MatLab, Arcview, Dreamweaver, Nvu, UNIX command line

Selected Grants and Awards

- Laboratoire d’Ecologie Alpine Travel Funds (\$350) 2011
- University of Notre Dame Conference Presentation Grant (\$250) 2009
- University of Notre Dame Departmental travel assistance (\$449) 2009
- University of Notre Dame Graduate School Downes Travel Grant (\$600) 2009
- University of Washington [Summer Institute in Statistical Genetics](#) tuition grant (\$1200) 2009
- American Society of Plant Biologists conference fee (\$150) and travel grant (\$575) 2009
- [Northern Nut Growers Association Research grant](#). “Genetic Evaluation of Cultivars of Butternut, Heartnut, and Buartnut” (\$9,100) 2008- 2009
- University of Notre Dame Kaneb Learning Center “[Advanced Teaching Scholar](#)” award 2009 and “[Striving for Excellence in College and University Teaching](#)” award 2008
- University of Notre Dame Professional Development Fund award (\$497) 2008
- University of Notre Dame [Arthur J. Schmitt Graduate Fellowship](#) 2005-present
- Bellarmine University summer study abroad award to study photojournalism in Ireland (\$3,000 for tuition, supplies and travel) 2004
- Kentucky [Biomedical Research Infrastructure Network \(KBRIN\)](#) Sponsored Summer Research Program (\$3,500 summer stipend) 2002
- Bellarmine University [Bellarmine Scholars](#) four-year full tuition scholarship 2001-2005
- Eagle Scout Award with bronze palm 1999

Teaching Experience

- Teaching Assistant, Dr. Gary Lamberti & Dr. Dominic Chaloner, Biostatistics, Spring 2010
Led lab and computer based exercises; graded problem sets; guided review sessions; assisted students with an independent, semester long data collection and analysis
- Invited guest lecturer, Dr. Jeanne Romero-Severson, Computational Biology, Fall 2009
Created a lecture, required reading list, and hands-on tutorial
- Teaching Assistant, Dr. Dominic Chaloner, Ecology Lab, Fall 2009
Led a field-based lab incorporating student designed hypotheses testing; guided small groups in design and implementation of independent research projects
- Teacher Apprenticeship, Dr. Jason McLachlan, Ecology, Spring 2009
Observed lecture and discussed pedagogy with mentor; guided small group discussions; provided feedback for group projects; lectured; assisted in choosing reading assignments and discussion topics; contributed essay questions for exams; assisted in grading
- Teacher Apprenticeship, Dr. Jeanne Romero-Severson, Plant Science, Fall 2008
Observed lecture and discussed pedagogy with mentor; lectured; facilitated class debates (forest policy, biofuels); led a 'tree tour' of campus; assisted in grading
- Teaching Assistant, Dr. Nora Besansky & Dr. David Severson, Genetics Lab, Spring 2007, 2008
Led lab exercises; participated in lab preparation including reagent prep, fruit fly breeding and protocol testing; assessed performance on lab reports; led study sessions
- Course Development, Dr. Hope Hollocher, Evolution Lab, Fall 2007
Assisted in development of syllabus, goals, and topic choice for Notre Dame's first Evolution lab course; designed two lab exercises; chose readings; created handouts
- Invited guest lecturer, Dr. Hope Hollocher, Evolution course, Spring 2007, Spring 2009, Spring 2010
- Private tutor, Educational Resources (Louisville, Kentucky), 2005
Individual tutoring for 4th through 8th grade students in a variety of subjects
- Tutor, Bellarmine University [Academic Resource Center](#), 2003-2005
Individual & group tutoring for Biology, Inorganic Chemistry, Physics and English

Reviewer for

International Journal of Plant Science
Conservation Genetics

Molecular Ecology Resources

Service Activities

- Northern Nut Growers Association Research Grant Committee (2009, 2011)
- Université Joseph Fourier Population Genetics Journal Group participant 2011
- University of Notre Dame [EEE \(Ecology, Evolution and Environment\) Friday Seminar](#) Coordinator 2010
- Christ the King Elementary School Science Fair Judge (2009, 2010)
- Game Day [Science Saturday Exploration](#) Series at University of Notre Dame (2009)
Assisted with a one day *Drosophila* genetics experiment designed for families
- [PlantingScience](#) Master Team (2009, 2010)
Provided feedback to both teachers and scientists regarding improvements for future sessions
- Scientist Mentor for K-12 grade students for [PlantingScience](#) (2009- 2011)
Guided teams of elementary and secondary students in designing and executing science projects; corresponded with student teams at least twice a week
- [University of Notre Dame Energy Center Student](#) Advisory Board Secretary (2009- present)
Assisted in planning lectures, film screenings and other activities for [energy education](#)
- University of Notre Dame [Biology Graduate Student Organization](#) Secretary (2009- present)
Published a monthly department newsletter
- Northern Indiana [Regional Science Fair](#) Judge (2007, 2010- Plant Science group leader in 2010)
- [Southern Appalachian Labor School](#) in Kincaid, West Virginia (2005) home construction
- [Raptor Rehabilitation of Kentucky](#) (2003) feeding birds and cleaning cages
- [Kentucky Human Society](#) (2003) assistant to veterinarian

Selected Training

University of Notre Dame [Green Summit II](#) 2009
St. Joseph County Next Steps in Math & Science Education Conference 2009
[AIBS](#) Outreach Training Workshop at University of Notre Dame 2009
University of Notre Dame Science and Ethics Workshop 2009
[Teaching Innovations course Botany](#) 2007

Current Membership In Professional Societies (member since)

American Society of Plant Biologists (2007)	Botanical Society of America (2008)
Northern Nut Growers Association (2007)	Society for Conservation Biology (2008)
National Association of Biology Teachers (2009)	Society for the Study of Evolution (2008)
American Association for the Advancement of Science (2009)	Ecological Society of America (2010)

Past Employment

Bellarmine University resident assistant (2003-2005)
Seneca Animal Hospital veterinary assistant (2003- 2004)
Louisville Zoo guest services (summers 2000, 2001, 2003)
Mary T Meagher Aquatic Center swim instructor (2000- 2001)

PhD Committee

Dr. Jeanne Romero-Severson (University of Notre Dame), Major Professor
Dr. Jason McLachlan (University of Notre Dame)
Dr. Nora Besansky (University of Notre Dame)
Dr. Scott Schlarbaum (University of Tennessee)