

Biographical Sketch

Jeremie Benjamin Fant, Ph.D.

Chicago Botanic Gardens, 1000 Lake Cook Road, Glencoe, IL 60022

Professional Preparation

Ph.D. Genetics, The University of Cambridge, UK, 2000; The conservation and maintenance of genetic diversity, both in situ and ex situ.

B.Ag.Sc. (Hons) in Horticultural Sciences, 1994; University of Adelaide, Australia.

Appointments

Current

Conservation Scientist, Molecular Ecology Chicago Botanic Gardens, Glencoe, IL.

Adjunct Assistant Professor of Biology, Northwestern University, Evanston, IL.

Illinois Endangered Species Board Member

IUCN SSC Conservation Genetics Specialist Group Member

Institutional Biosafety Committee at DePaul.

Previous

2001-2002 Post Doctorate, Advisor; Jeff Conner Dept of Plant Biology, Kellogg Biological Station, Michigan State University. "Identifying quantitative traits loci, using AFLP and SSR, which are important in floral biology of Wild Radish (*Raphanus Raphanistrum*)."

2000-2001 Sequencing Facility, Dept of Genetics, University of Cambridge.

1999-2000 Post Doctorate, Advisor Sean Mayes, University of Cambridge, Dept of Genetics. "Constructing of a genetic map of Oil Palm, using AFLP markers, to identify quantitative traits for oil production."

1994-1995 Scholefield Robinson Horticultural Professional Consultancy Services Pty. Ltd.

Publications (± = Postdoc, + = PhD Student, ++ = MA Student, * = Undergraduate Student, # =Citizen Scientist)

Fant, J.B. , K. Havens, A.T. Kramer, S.K. Walsh, T. Callicrate, R.C. Lacy, M. Maunder, A. Hird Meyer, and P.P. Smith (2016) What to do when we can't bank on seeds: What botanic gardens can learn from the zoo community about conserving plants in living collections American Journal of Botany (Accepted)

Fant J.B., Price, A.++ and D. Larkin (Online early) The influence of habitat disturbance on genetic structure and reproductive strategies within stands of native and non-native *Phragmites australis* (common reed)" Diversity and Distributions (Online early).

Lewis E.M. ++, Fant J.B., Moore M.J., Hastings A.P., Larson E.L., Agrawal A.A., Skogen K.A. (2016) Microsatellites for *Oenothera gayleana* and *O. hartwegii* subsp. *filifolia* (Onagraceae), and their utility in section Calylophus. Appl Plant Sci. Feb 9;4(2).

Skogen, K. A., T. Jogesh, E. T. Hilpman*, S. L. Todd*, M. K. Rhodes*, S. Still, and J. B. Fant. *In Press*. Land-use change has no detectable effect on reproduction in a disturbance-adapted plant pollinated by long-distance dispersing hawkmoths. American Journal of Botany.

Williams, E.W. ±, R. Cheung*, C. Siegel*, M. Howard, J. Fant, K. Havens (2016) Persistence of the gypsophile *Lepidospartum burgessii* (Asteraceae) through clonal growth and limited gene flow. Conservation Genetics; 17 (5) pp 1201–1211

Barak, R. S.++, J. B. Fant, A. T. Kramer, and K. A. Skogen. (2015). Assessing the value of potential "native winners" for restoration of cheatgrass-invaded habitat. Western North American Naturalist 75(1) 58-69.

Basey A.++, J.B Fant, A.T. Kramer (2015) Producing native plant materials for restoration: ten rules to collect and maintain genetic diversity. Native Plants Journal 16:37-53.

Havens K., P. Vitt, S. Still, A.T. Kramer, J.B. Fant, and K. Schatz (2015) Seed Sourcing for restoration in an era of climate change. Natural Areas Journal 35(1) 122-133

Kim, E.S. ++, D.N. Zaya+, J.B. Fant and M.V. Ashley (2015) Genetic factors accelerate demographic decline in rare *Asclepias* species. Conservation Genetics 16(2) 359-369

Kramer A.T., D Larkin and J.B. Fant, (2015) Assessing potential seed transfer zones for five forb species from the Great Basin floristic region, U.S.A.. Natural Areas Journal 35(1) 174-188

Stahlin B++ & J.B. Fant (2015) Climate change impacts on seedling establishment for a threatened endemic thistle. The American Midland Naturalist 173(1):47-60. 2015

- Wilson A.W., N.J. Wickett, P. Grabowski, J.B. Fant, J. Borevitz and G.M. Mueller (2015) Examining the efficacy of a genotyping-by-sequencing technique for population genetic analysis of the mushroom *Laccaria bicolor* with either a reference genome or simple de-novo analysis. *Mycologia* 107 (1) 217-226
- Fant, J.B., K. Havens, J.M. Keller#, A. Radosavljevic+ and E.D. Yates and K. Havens (2014) The influence of contemporary and historic landscape features on the genetic structure of the sand dune endemic, *Cirsium pitcheri* (Asteraceae). *Heredity* 112, 519–530
- Herman B, S Packard, Cathy Pollack, G. Houseal, S. Sinn, C. O’Leary, J. Fant, A.D. Lewis, S. Wagenius, D. Gustafson, K. Hufford, Bob Allison, K. Shaw, S. Haines and C. Daniels (2014). Decisions... Decisions... How to Source Plant Material for Native Plant Restoration Projects. *Ecological Restoration* 32 (3) 236-238.
- Ksiazek, K+, J. Fant and K. Skogen (2014) Native forbs produce high quality seeds on Chicago green roofs. *Journal of Living Architecture* 2:e2.
- Overholt, W. A., M. P. Sowinski, D. C. Schmitz, J. Schardt, V. Hunt, D. J. Larkin, and J. B. Fant. 2014. Early detection and rapid response to an exotic *Phragmites* population in Florida. *Aquatics* 36:5-7.
- Price, A. ++, J.B. Fant and D. Larkin (2014) Ecology of native vs. exotic *Phragmites australis* (common reed) in Chicago-area wetlands. *Wetlands* 34 (2) 369-377
- Rhodes++, M., J.B. Fant and K.A. Skogen (2014) Local topography shapes fine-scale spatial genetic structure in the Arkansas Valley evening primrose, *Oenothera harringtonii* (Onagraceae) *Journal of Heredity* 105(6):806-15
- Fant, J.B., A.T. Kramer, E. Sirkin# and K. Havens (2013) Genetics of reintroduced populations of the narrowly endemic thistle, *Cirsium pitcheri* (Asteraceae). *Botany* 91 (5) 301-308
- Fant J.B., H. Weinberg-Wolf*, D.C Tank, K.A. Skogen, (2013) Characterization of 12 microsatellite markers in *Castilleja sessiliflora* and transferability to other *Castilleja* species. *American Journal of Botany Applications in Plant Sciences*. 1(6):1200564.
- Ksiazek, K. ++, J. B. Fant and K. Skogen. (2012) An assessment of pollen limitation on Chicago green roofs. *Landscape and Urban Planning*. 107 (4) 401-408
- Skogen, K., E. Hilpman, S. Todd, and J. B. Fant. (2012) Microsatellite primers in *Oenothera harringtonii* (Onagraceae), an annual endemic to the shortgrass prairie of Colorado. *American Journal of Botany Primer Notes and Protocols in the Plant Sciences*;99(8):e313-6
- Fant, J.B. (2011) Book Review: *Plant Microevolution and Conservation in Human-Influenced Ecosystems*. *The Quarterly Review of Biology* 86(2) pg 146
- Kramer, A.T. +, J.B. Fant and M. Ashley (2011) Influences of landscape and pollinators on population genetic structure: Examples from three *Penstemon* (Plantaginaceae) species in the Great Basin. *American Journal of Botany* 98(1): 109–121.
- Ksiazek, K. ++, J. Fant and K. Skogen. 2011. An assessment of pollination services on Chicago green roofs. In *Proceedings of the CitiesAlive! Ninth Annual Green Roof and Wall Conference*. Philadelphia, PA, 2011. Toronto: Green Roofs for Healthy Cities.
- Ribbens E., B.A Anderson. ++, and J. Fant (2011) *Opuntia fragilis* (Nuttall) Haworth in Illinois: Pad Dynamics and Sexual Reproduction *Haseltonia*, 16(1):67-78. 2011.
- Tonietto R++, J. Fant, J Ascher, K. Ellis* and D Larkin (2011) A comparison of bee communities of Chicago green roofs, parks and prairies. *Landscape and Urban Planning* 103: 102– 108
- Fant, J.B., A. Banai++, K. Havens and P. Vitt (2010) Morphological and molecular evidence of hybridization between the federally threatened *Lespedeza leptostachya* Englem. and its co-occurring congener *Lespedeza capitata* Michx. *Conservation Genetics* 11 (6) 2195-2205
- Maschinski J., E. Sirkin# and J.B. Fant (2010) Using Genetic and Morphological Analysis to distinguish endangered taxa from their hybrids with the cultivated exotic pest plant *Lantana strigocamara* (syn: *Lantana camara*) *Conservation Genetics* 11 (5) 1607-1621
- Fant, J.B., R.M.Holmstrom++, E. Sirkin#, J.R. Etterson, and S. Masi (2008) Genetic structure of threatened native populations and propagules used for restoration, in a clonal species, *Ammophila breviligulata* (American beachgrass). *Restoration Ecology* 16 (4) pp. 594-603.
- Fant, J.B., S. Masi, J.M. Keller#, and R. Mann (2007) Investigating the reproductive health of Hill’s thistle’s (*Cirsium hillii*) populations in the Chicago Region. *Chicago Wilderness Journal: Volume 5, Number 1, March 2007*
- Kramer, A.T.+ and J.B. Fant. (2007) Isolation and characterization of microsatellite loci in *Penstemon rostriflorus* (Plantaginaceae) and cross species amplification. *Molecular Ecology Notes* 7 (6), 998–1001.

- Fant, J.B., E. Kamau, and C.D. Preston (2005) Chloroplast evidence for the hybrid origin of *Potamogeton x fluitans*. *Aquatic Botany* 83 (2) 154-160
- Fant J.B. and C.D. Preston (2004) Genetic structure and morphological variation of British populations of the hybrid *Potamogeton x salicifolius* Wolfg. *Bot. J. of the Lin. Soc* 144 (1): 99-112
- Fant, J.B., E. Kamau and C.D. Preston (2003) Chloroplast evidence for the hybrid origin of *Potamogeton x sudermanicus* Hagstr. *Aquatic Botany* 75 (4): 351-356
- Fant, J.B., C.D. Preston and J.A.Barrett (2001) Isozyme evidence of the hybrid origin of *Potamogeton x sudermanicus* as resulting from the cross between *P.berchtoldii* and *P.acutifolius*. *Aquatic Botany* 71(3): 199-208
- Fant, J.B., C.D. Preston and J.A.Barrett (2001) Allozyme evidence of the parental origin and possible fertility of the hybrid *Potamogeton x fluitans*. *Plant Systematics and Evolution* 229 (1-2): 45-57

Invited Presentations

- Life Sciences Seminars- Purdue Northwest (2016) "Importance of incorporating genetics into restoration decisions making; and when to rebelling against the rules might be the best solution"
- ICCB Workshop – Integrating Conservation Genetics into policy practical issues, Q&A and Consensus building (2015); (Organized Gernot Segelbacher and Sean Hoban)
- Wabash College (2014) – Seminar series." Genetic Primer for seed selection; examples from Great Basin" & "Genetics and Restoration of *Cirsium pitcheri*"
- SER Symposium - Genetic Diversity and Restoration Seed Sourcing: Status of the Science (2013) Genetic Consideration for restoration of rare species Lessons learnt from *Cirsium pitcheri* and *Asclepias lanuginosa* reintroductions
- BSA Symposium - Transplantations and relocation of species at risk: learning from the past to plan for the future (2012) Post-glacial migration, biogeography and genetics of a narrow endemic thistle, *Cirsium pitcheri* (Asteraceae) : Consequences for restorations
- Plant Material Sources for Ecological Restoration Conference - U. S. Army Corps of Engineers (2012) Genetic consideration for restoration of Rare Species.
- Lake Forest College Biology Department Fall seminar series (2011) Glacial migration, biogeography and conservation of a narrow endemic thistle, *Cirsium pitcheri*
- Western Forestry Genetics (2011) Restoration genetics and the genetic, demographic and community factors that influence restoration success.
- Trinity International University (2010): Landscape, gene-flow & genetic history: their influence on population genetic structure. Examples from *Penstemon* and *Cirsium*.
- University of Chicago (2010): Landscape, gene-flow & genetic history: their influence on population genetic structure. Examples from *Penstemon* and *Cirsium*.
- 10th Biennial Conference of Research on the Colorado Plateau, Flagstaff, AZ (2009): The role of reproductive ecology and conservation genetics of plant species on ecosystem restoration"
- University of Madison Botany Colloquium (2008):Local Adaptation, Gene Flow and Inbreeding in *Cirsium pitcheri* and consequences for Restorations
- Field Museum A. Watson Armour Seminar Series (2008): Genetics and Restoration of a locally Extirpated Species (*Cirsium pitcheri*): Or is Wisconsin really better than Indiana?
- Lake Forest College Biology Department Fall seminar series (2007): "*Penstemon* pollinators and local adaptation"
- Associated Colleges of the Chicago Area Biology Seminar series "Biogeography" (2007): "Biogeographic variation in pollinator-plant interactions, a *Penstemon* case study".
- ICEP Colloquium, Northwestern PBC (2007): "Floral syndromes within *Penstemon* species: Intraspecific variation in flower shape and pollinator community"

Grants

Current

- PI with Andrea Kramer (Co-PI) 2015-2017: REU Site: Plant Biology & Conservation Research Experiences Undergraduates - From Genes to Ecosystems (\$330,997)
- Co-PI with Krissa Skogen (PI) and Norman Wickett 2014-2018. Landscapes of Linalool: Scent-Mediated Diversification of Flowers and Moths across Western North America. NSF funded Dimensions in Biodiversity (\$1,459,000)

- PI, 2015-2016: Genetic assessment of management and restoration practices of the federally threatened Prairie Orchid. USFWS (\$20,390)

Previous

- Co-PI with Larkin 2012-2014: REU Site: Plant Biology & Conservation Research Experiences Undergraduates - From Genes to Ecosystems (\$513,997)
- Co-PI with Haven and Williams 2013–2014. Characterization of self-incompatibility in *Lepidospartum burgessii*, a narrow Endemic from New Mexico. National Fish and Wildlife Foundation. (\$40,000)
- Co-PI with Kramer, Larkin, and Skogen 2012–2014. Learning from native ‘winners’ in degraded sites on the Colorado Plateau. Bureau of Land Management ().
- Co-PI with Larkin and Lonsdorf 2012-2013: A cooperative-learning network for adaptive management of Phragmites-invaded coastal habitats. The Illinois-Indiana Sea Grant proposal (\$40,000)
- Co-PI with Havens, Skogen, Vitt and Wagenius: Acquisition of a seed x-ray machine. NSF-MRI (DBI-1125997) \$136,597
- Co-PI with Zaya (UIC): 2011-2013 “Investigating the role of genetic diversity and pollination biology as potential causes for reproductive failure in *Asclepias lanuginosa* Proposal to Illinois Endangered Species Protection Board (\$7,000)
- Co-PI with Haven 2011–2012. Characterization of *Lepidospartum burgessii* genetic diversity. Bureau of Land Management. \$25,000
- Co-PI with Havens, Vitt, Bowles and Bell: Integrating Long Term Demographic Data and Repeated Genetic Sampling for Viability Analysis of Natural and Restored Populations of Pitcher’s Thistle(2005-2010) NSF LTREB: (\$300,000)
- Co-PI with Larkin, Skogen and Yates: Testing restoration effectiveness under a changing climate (2010) National Fish and Wildlife Foundation – Native Plant Conservation Initiative: (\$45,000)
- Co-PI with Larkin: Ecological genetics of *Phragmites australis* invasion in southern Lake Michigan coastal habitats (Seed) The Illinois-Indiana Sea Grant proposal (\$10,000)
- Co-PI with Vitt, Havens, Larkin and Skogen: NSF- MRI: Acquisition of Conservation Geographic Information Systems (GIS) Instrumentation (\$363,547)
- Co-PI with Andrea Kramer and Havens. *Genetic diversity in seed collections* (\$20,000). Use of genetic analyses to compare bulked common garden samples against wild collection sites, with the aim of guiding seed production practices to maximize genetic diversity. (2005 – 2007) Bureau of Land Management (\$20,000)
- Co-PI with Kramer: Development of species-specific markers for 18 threatened or endangered *Eriogonum* and *Penstemon* species (2005-2006) National Fish and Wildlife Funded grant: (\$15,000).
- Co-PI with Havens, Vitt, Wagenius and Ault: NSF MRI:Acquisition of a Seed Biology Laboratory (2006) (\$284,066)
- Co-PI with Havens and Kramer: Investigating effect of cheatgrass on pollinator communities (2006). Center for Invasive Plant Management (\$5,000)
- Map genetic diversity of *Cirsium hillii* in the Chicago region to determine the contribution of inbreeding depression to poor reproductive success (2005-2006). Chicago Wilderness grant (\$15,000)
- Potential hybridization between rare endemic and Invasive species of Lantana. (2005-2006) Fairchild Tropical Botanic Garden (\$12,000)

Teaching

2009-Present	Co-taught – Reproductive Biology and Genetics, Field and Lab Methods in Plant Biology and Conservation (PBC 450), Master Students Northwestern University
2011-Present	Co-taught – Conservation Genetics Bio 332/PBC 430), Undergraduate and Master Students Northwestern University
2010	Plant Interactions with their Biotic Environment (BIOL SCI 333/PBC 410), Undergraduate and Master Students Northwestern University
2008	Molecular Ecology (PBC 425) , Master Students Northwestern University
2000-2001	Population and Plant Genetics, final year undergraduates; University of Cambridge.
2001-	Population Genetics, 3 rd year student, University of Leeds.
1996-2001	Bridge classes for Quantitative Biology, 1 st year Students, University of Cambridge
1886-2001	Elementary Biology for Biologist courses, 1 st year Students, University of Cambridge

1997-2000 Bridge classes for the Organisms courses, 1st year Students, University of Cambridge

Students advised

Post-Doctorate

Evelyn Williams (PhD 2012, UW-Madison)	2011-2014
Rick Overson (PhD 2011, Arizona State University)	2014- Present
Tania Jogesh (PhD 2014, University of Illinois, Champaign Urbana)	2014- Present

Graduate

Principal advisor: Adrienne Basey (MA 2015, NU – Co-advised with Andrea Kramer), Alona Banai (MA 2008, NU), Anna Braun (Current 2013, NU), Claire Ellwanger (Current MA, NU), Kristopher Bonefort Flores (Current MA, NU), Anita Cisternas Fuentes (Current PhD, NU), Kelly Ksiazek (MA 2011, NU), Benjamin Staehlin (MA 2009, NU), Mary Stupen (UIUC), Rebecca Tonietto (MA 2009, NU), Katherine Wenzell (Current PhD, NU), Abigail White (Current MA, NU – Co-advised with Andrea Kramer), Laney Widener (MA 2014, NU), Chris Woolridge (Current MA, NU – Co-advised with Andrea Kramer)

Committee member: Becky Barak (MA 2012, NU), Emily Booth (MA 2011, NU), Joshua Drizin (MA 2012, NU), Magdalena Eshleman (Current MA, NU), Alicia Foxx (MA 2013, NU), Melissa Gray (MA 2011, NU), Eun Sun Kim (Current PhD, UIC), Andrea Kramer (PhD 2008, UIC), Kelly Ksiazek (PhD Candidate, NU), Emily Lewis (Current 2015, NU), Theresa Melhem (MA 2015, NU), Tracy Misiewicz (MA 2009 NU), Rachel Olson (MA 2009 NU), Amy Price (MA 2012, NU), Matt Rhodes (MA 2013, NU), Ricardo Rivera (MA 2012, NU), Erin Vander Stelt (Current MA, NU), Maria Wang (MA 2014, NU), David Zaya (PhD 2012, UIC)

Undergraduates

REU-NSF: Sohier Dane (Northwestern University), Jillian Clark (Howard University), Laura Cronin (John Carroll University), Evan Eifler (University of Wisconsin), Sahar Haghighat (Monmouth College), Jesse Lundgren (Carthage College), Joslyn Mink (University of Wisconsin, Madison), Noah Sokol (University of Guelph), Hosin West (University of New Haven), Lisa Cheung (Carleton College), Patricio Ansaldo (University of California at Santa Barbara), Rachel Wells (Hendrix College)

Other REU (Summer and Semester) : Adewale Adeoba (Loyola University), Elina Dilmukhametova (Lake Forest College), David Ford (Loyola University), Charles Flowe (Trinity Int Uni), Charlie Flower (LFC), Keith Hartley (LFC), Shayla Hobbs (UIUC), Clément Kouyoumdjian (Univ of Renne, France), Samantha Knopp (Trinity Int Uni), Jesse Urhe (LFC), Robin Picaud (Univ of Renne, France), Cory Querubin (LFC), Grace Schlafly (LFC), Hannah Weinberg-Wolf (John Hopkins), Alexander Shaffer (Northwestern University), Jeremy Sutherland (University of Illinois Chicago), Deisi Williamson (DePaul University), Rosalba Herrera (Loyola University), Elina Dilmukhametova (Lake Forest College), Rosalba Herrera (Loyola University Chicago), Erica Rocha (Dominican University), Dionna Bidny (Oakton College),

High School

Marlene Arellano (College First), Allison Buiser (College First), Martitza Crespo (College First), Robert Harris (College First), Jazmine Hernandez (College First), Oscar Herrera (College First), Jocelyn Ramirez (College First), Nicole Baylon (St Martin de Porres High School), Octavio Brindis (St. Martin de Porres High School), Kevin (Cheung (Stevenson High School), Laura Kochlefl (New Trier High School), Rebecca Nelson (Stevenson High School), Lea Michelle Nowack (Stevenson High School), Nikita Saladi (New Trier High School), Christine Zhao (Stevenson High School)

Professional Services

Professional Affiliations

Botanical Society of America, Ecological Society of America, America Society of Botanical Illustrators.

Institutional Biosafety Committee member

DePaul University

Manuscript reviewer

American Journal of Botany, Annales Botanici Fennici, Annals of Botany, Applied Vegetation Science, Aquatic Botany, Biological Conservation, Botanical Bulletin of Academia Sinica, Folia Geobotanica, Heredity, International Journal of Plant Science, Molecular Ecology, Plos-one, Plant Systematics and Evolution, Preslia, Restoration Ecology, Telopea,

NSF Panelist: Informal Science Education

Proposal Reviewer

National Science Foundation reviewer for *Population and Evolutionary Processes*

Policy reviewer

Recovery criteria for endangered plants (CPC)

Ecotype literature review (CPC)

Collaborators and other affiliations

Collaborators within the past 48 months

Mary Ashley (UIC), Alona Banai (Loyola University), Tim Bell (Chicago State University), Justin Borevitz (Univ. of Chicago), Marlin Bowles (Morton Arboretum), Diane Byers (Illinois State University) Jeffrey Conner (Michigan State University), Julie Etterson (University of Minnesota, Duluth), Pam Geddes (NIU), Alden Griffith (Wellesley College), Kay Havens (Chicago Botanic Garden), Chrystal Ho Pao (Trinity Int Uni), Tom Kaye (Institute of Applied Ecology), Kathleen Kay (University of California Santa Cruz), Andrea Kramer (BGCI), Tiffany Knight (Washington University in St Louis), Daniel Larkin (Chicago Botanic Garden), Joyce Maschinski (Fairchild Tropical Botanic Gardens), Greg Mueller (Chicago Botanic Garden), Peggy Olwell (BLM), Rob Raguso (Cornell Uni), Eric Ribbens (WIU), Krissa Skogen (Chicago Botanic Garden) David Tank (U.Idaho), Pati Vitt (Chicago Botanic Garden), Stuart Wagenius (Chicago Botanic Garden)

Graduate Advisor

John Barrett (U. of Cambridge)

Christopher Preston (Centre of Ecology and Hydrology)

Post-Doc Advisor

Sean Mayes (U. of Nottingham)

Jeff Conner (Mich State Uni)