

# JESSICA L. BURNETT

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## Education

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**Ph.D., Natural Resource Sciences, Specialization Applied Ecology** 2015 - 19  
School of Natural Resources, University of Nebraska-Lincoln, Nebraska USA

**M.Sc., Wildlife Ecology & Conservation** 2013 - 15  
Department of Wildlife Ecology & Conservation, University of Florida, Florida USA

**B.Sc. Wildlife Ecology & Conservation** 2010 - 13  
Department of Wildlife Ecology & Conservation, University of Florida, Florida USA

## Skills Highlight

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Languages: R, LaTeX, MatLab, HTML, English  
Reproducibility and open science  
Applied statistics  
Avian ecology and conservation  
Population trend and parameter estimation

## Professional Experience

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**Research Ecologist & Mendenhall Postdoctoral Fellow** September 2019 - present  
Science Analytics and Synthesis, Core Science Systems  
U.S. Geological Survey, Lakewood, Colorado, USA

**Graduate Research Assistant** August 2015 - August 2019  
Nebraska Cooperative Fish & Wildlife Research Unit  
School of Natural Resources  
Department of Agronomy & Horticulture  
University of Nebraska-Lincoln, Nebraska, USA

**Young Scholar** May 2018 - September 2018  
Applied Systems Analysis Research Group  
International Institute for Applied Systems Analysis Laxenburg, Austria

**Graduate Teaching Assistant** August 2013 - August 2015  
Department of Wildlife Ecology & Conservation  
University of Florida, Florida, USA

**Geospatial Analyst Intern** April 2012 - August 2012  
Florida Fish and Wildlife Research Institute Gainesville, Florida, USA

**Research Assistant** January 2011 - April 2012  
Avian Ecology and Conservation Lab University of Florida, Gainesville, FL, USA

**Crew Leader, Smithsonian Fellow** April-September 2011 and April-September 2013  
Neighborhood Nestwatch Program  
Smithsonian Migratory Bird Center, Gainesville, FL, USA

## Publications

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1. **Burnett, J.L.**, L.S. Wszola, and G. Palomo-Munoz. 2019. bbsAssistant: An R package for downloading and handling data and information from the North American Breeding Bird Survey. Journal of Open Source Software, 4(44), 1768, DOI: [10.21105/joss.01768](https://doi.org/10.21105/joss.01768)

2. Donovan, V.M., **J.L. Burnett**, C.H. Bielski, H.E. Birge, R. Bevens, D. Twidwell, and C.R. Allen. 2018. Social-ecological landscape patterns predict woody encroachment from native tree plantings in a temperate grassland *Ecology and Evolution* 8(19): 9624-9632 DOI:10.1002/ece3.4340
3. **Burnett, J.L.**, K.L. Pope, A. Wong, C.R. Allen, D.M. Haak, B.J. Stephen, and D.R. Uden. 2018. Thermal tolerance limits of the invasive Chinese mysterysnail *Bellamya chinensis* and implications for management". *American Malacological Bulletin* 36(1): 140-144 DOI:10.4003/006.036.0106
4. Roberts, C.P., D. Twidwell, **J.L. Burnett**, V.M. Donovan, C. Wonkka, C.H. Bielski, A.S. Garmestani, D.G. Angeler, T. Eason, B.W. Allred, M.O. Jones, D.E. Naugle, S. Sundstrom, C.R. Allen . 2018. Early warnings for state transitions. *Rangeland Ecology and Management* DOI:10.1016/j.rama.2018.04.012
5. La Sorte, F.A., C.A. Lepczyk, **J.L. Burnett**, A. Hurlbert, M. Tingley, and B. Zuckerberg. 2018. Opportunities and challenges for big data ornithology. *The Condor* 120(2): 414-426 DOI:10.1650/CONDOR-17-206.1
6. Chuang, W.C., A.S. Garmestani, T. Eason, T.L. Spanbauer, H.B. Fried-Peterson, C. Roberts, S. Sundstrom, **J.L. Burnett**, D. G. Angeler, B. Chaffin, L. Gunderson, D. Twidwell, C.R. Allen. 2018. Enhancing quantitative approaches for assessing ecological and community resilience. *Journal of Environmental Management* 213: 353-362 DOI:10.1016/j.jenvman.2018.01.083
7. **Burnett, J.L.**, C.R. Allen, C.P. Roberts, M. Bomberger Brown, and M.P. Moulton. 2017. Eurasian Tree Sparrow (*Passer montanus*) range expansion in North America. *Biological Invasions* 19(1): 5-9 DOI:10.1007/s10530-016-1273-4
8. **Burnett, J.L.** and K.E. Sieving. 2016. Songbird distress call as a detection enhancement method and application to Red-shouldered Hawks (*Buteo lineatus*). *Florida Field Naturalist* 44(4):157-168
9. C.R. Allen, H.E. Birge, S.L. Bartlett-Hunt, R.A. Bevens, **J.L. Burnett**, B.A. Cosens, X. Cai, A.S. Garmestani, I. Linkov, E.A. Scott, M.D. Solomon, and D.R. Uden. 2016. Avoiding decline: Fostering resilience and sustainability in midsize cities. *Sustainability* 8(9):844-868 DOI:10.3390/su8090844
10. **Burnett, J.L.** and M.P. Moulton. 2015. Recent trends in House Sparrow (*Passer domesticus*) distribution and abundance in Gainesville, Alachua County, Florida. *Florida Field Naturalist* 43(4):167-172

## Book Chapters

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1. **Burnett, J.L.** and C.R. Allen. 2020. Continental Analysis of Invasive Birds: North America in Downs, C.T. and Hart, L.A. (eds) Global trends and impacts of alien invasive birds. CABI, Wallingford, U.K., pp. XX-XX.

## Manuscripts Under Review (primary author)

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1. **Burnett, J.L.**, R. Wilcox, B. Stephen, D. Haak, D. Uden, C.R. Allen, and K. Pope. Shell strength does not limit predation of an invasive snail species (*Bellamya chinensis*) by native fish. *under review at Malacological Bulletin*

## Manuscripts in Preparation (primary author)

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1. **Burnett, J.L.**, et al. Great Tit (*Parus major*) range expansion in the Northern U.S.
2. **Burnett, J.L.**, N.B. Price, A.J. Tyre, D.G. Angeler, T. Eason, D. Twidwell., and C.R. Allen. Deconstructing the steps for calculating Fisher Information as a measure of abrupt change in ecological systems.
3. **Burnett, J.L.**, Kratter, A. and Robinson, S.K. Using a Christmas Bird Count to understand local and regional changes in bird populations in Northcentral Florida.

4. **Burnett, J.L.**, N.B. Price, C.R. Allen, D. Twidwell, A.J. Tyre. Velocity of distance travelled as a measure of ecosystem trajectory and abrupt change.
5. **Burnett, J.L.**, Z. Warren, M. Podebrovska, B. Dueker, K. Lamke, B. Seguin, D. Twidwell, and C.R. Allen. Sexual size dimorphism in mammalian communities of Mediterranean Australian regions.
6. **Burnett, J.L.**, L. Wszola, N. Mirochnitchenko, E. Stuber, M. Bomberger Brown, C.R. Allen, D. Twidwell, and J. Carroll. Large-scale crop patterns influence Gray Partridge (*Perdix perdix*) site occupancy in North America.
7. **Burnett, J.L.**, B.D. Fath, E. Rovenskaya, and A.J. Tyre. Effects of data quality and quantity on inference gained from regime shift detection methods.

## Notable Code and Software

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### Lifecycle: maturing, stable

1. **Burnett, J.L.**, L.S. Wszola, and G. Palomo-Munoz. 2019. [bbsAssistant](#): An R package for downloading and handling data and information from the North American Breeding Bird Survey: U.S. Geological Survey software release. DOI: [10.5066/P93WoEAW](#).
2. Price, N.B., C. Chizinski, and **J.L. Burnett**. [radsets](#). An R package for interactive, network-based visualizations of overlapping sets. [Github:natbprice/radsets](#)
3. **Burnett, J.L.**, N.B. Price, and A.J. Tyre. [distanceTravelled](#). An R package for calculating the distance traveled by a multispecies community along a time series.
4. Price, N.B. and **J.L. Burnett**. [tvdiff](#). An R package for numerical differentiation of noisy, non-smooth data. [Github:natbprice/tvdiff](#)

### Lifecycle: dormant

1. **Burnett, J.L.**, N.B. Price. [regimeDetectionMeasures](#). An R package for calculating univariate and multivariate regime detection methods using community time series.

### Lifecycle: experimental

1. **Burnett, J.L.**, et al. [USAvian](#): An interactive map for connecting and visualizing the bird conservation and management networks in the U.S.

## Research Grants

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### Funded

#### 2020

Pedersen, E., **J.L. Burnett**, G. Simpson, C. Bahlai. 2020. Creating a unified approach to evaluate regime shift detection methods. **\$12,400 CAD**

#### 2019

Mendenhall Postdoctoral Research, Core Science Systems Science Analytics and Synthesis, U.S. Geological Survey. **~\$222,000**

### Under Review

Pedersen, E., **J.L. Burnett**, G. Simpson, C. Bahlai. Creating a unified approach to evaluate regime shift detection methods. Powell Center Synthesis Working Group, U.S. Geological Survey **\$166,642**  
 Informing the design and deployment of a conservation tool, USAvian: learning through co-production, synthesizing lessons learned. Community for Data Integration, U.S. Geological Survey **\$70,539** ## Not Funded

2019

Benito, X., C. Bahlai, **J.L. Burnett**, E. Pedersen, and G. Simpson. SESYNC working group proposal.

2018

**Burnett, J.L.** Population Biology Program of Excellence (PoE) Postdoctoral Fellowship, University of Nebraska-Lincoln

**Burnett, J.L.**, C.R. Allen, G. Sugihara, and H. Ye. Scale mismatches in ecological research and management: consequences and solutions through data management. Powell Center Synthesis Working Group, U.S. Geological Survey

2016

**Burnett, J.L.** Mozilla Fellowship for Science

2013

**Burnett, J.L.** NSF Graduate Research Fellowship

## Fellowships, Honors & Awards

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2019

School of Natural Resources, University of Nebraska-Lincoln	\$750
University of Nebraska Graduate Travel Fund	\$750
Association for Women in Mathematical Biology	\$650
School of Natural Resources, University of Nebraska-Lincoln	\$1050

2018

<a href="#">Meritorious Graduate Student</a> award, School of Natural Resources, UNL	\$500
National Academy of Sciences research award	\$5,500
Participant, <a href="#">Research Collaboration Workshop for Women in Mathematical Biology, NIMBIOS</a>	\$900
National Science Foundation & NimBios	\$550
Nelson Memorial Fellowship, University of Nebraska-Lincoln ( <i>3x recipient, 2016, 17, 18</i> )	<b>totaling \$3,217</b>
Center for Great Plains Studies travel award, University of Nebraska-Lincoln ( <i>4x recipient; 2015, 2016, 2017, 2018</i> )	<b>totaling \$3,000</b>

2017

Kellogg Biological Station, Michigan State University	\$500
Big Ten Academic Alliance Traveling Scholar	

2016

2nd place, School of Natural Resources Elevator Speech Competition	\$300
American Ornithologists' Union travel award	\$250
Fling Fellow, University of Nebraska-Lincoln	\$20,000
Othmer Fellow, University of Nebraska-Lincoln	\$24,000
AAAS/Science Program for Excellence in Science Award	
Graduate Fellow, Center for Great Plains Studies, University of Nebraska	

## 2015

Resilience Alliance Young Scholar, The Resilience Alliance (2015-2017)	2015 - 17
NSF Diversity Travel Award, Southeastern Ecology and Evolution Conference	\$650
Graduate Student Council, University of Florida	\$350
Office of Research, University of Florida	\$350

## 2014

Travel Award, Department of Wildlife Ecology & Conservation, University of Florida (*2x recipient*) \$500

## 2013

Travel Award, Office of the Dean, Institute of Food and Agricultural Sciences, University of Florida	\$750
American Ornithologists' Union Undergraduate Student Membership Award	
IFAS Extension Internship for Undergraduate Research, University of Florida	\$2,200
Ordway-Swisher Biological Station Undergraduate Research Grant, University of Florida	\$550

## Teaching

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### *Course Development*

**Reproducible Research and Collaboration in Ecology.** Course materials can be found on [GitHub](#).

### *Instruction*

**Co-instructor** Introduction to Applied Ecological Statistics, Kearney, NE 2017 - Week-long workshop for employees of the Nebraska Game and Parks Commission employees

**Instructor** Introduction to Program R 2017 - Designed and taught a series of half-day workshops for graduate students - Basics of data management and analysis using Program R

**Guest Lecturer** Module: using citizen science data to understand ecological invasions; Course: Avian Invasions 2016 - Designed and taught series of lectures on citizen science data use and applications

**Teaching Assistant** Wildlife Population Ecology, Department of Wildlife Ecology & Conservation, University of Florida 2015 - Lead quantitative laboratory sessions

**Teaching Assistant** Ecological Statistics, Department of Wildlife Ecology & Conservation, University of Florida 2015 - Lead and moderate discussions - Provide statistical support

**Guest Lecturer** Wetland birds module, Florida Master Naturalist 2013 - Designed and taught module on wetland bird identification and ecology

## Organized Sessions & Symposia

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1. Using the integrated modelling framework to bridge science and decision making: advances, applications, and opportunities. Co-organizer with J.A. Royle. Ecological Society of America conference 2020
2. Opportunities and Challenges in Big Data Ornithology. Co-organizer with F.A. LaSorte and C.A. Lepczyk. North American Ornithological Conference V, Washington, D.C. 2016

## Presentations (primary author)

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### *Invited*

1. Regime Detection Measures for the Practical Ecologist, Department of Wildlife Ecology & Conservation, University of Florida 2019

2. Detecting abrupt change in bird community time series using distance travelled. *Association for Women in Math Biology Symposium*, Special session "Current Challenges in Mathematical Biology", Houston, TX 2019
3. Decline of the Once-Ubiquitous House Sparrow in North America. *Nebraska Invasive Species Council*, Lincoln, NE 2015

#### Contributed

1. **Burnett, J.L.**, N.B. Price, and A.J. Tyre. A novel method for tracking ecosystem trajectory and abrupt change in space-time: distance traveled. *International Association for Landscape Ecology*, Oral presentation. Fort Collins, CO, 2019
2. **Burnett, J.L.**, R. Crystal-Ornelas, D. Fogarty, K. Hogan, C.R. Allen, M. Bomberger Brown, D. Twidwell, and C.A. Lepczyk. Impacts of non-native birds on native wildlife in urban ecosystems: where is the evidence? *Natural Areas Conference*, Oral presentation. Indiana, 2018
3. **Burnett, J.L.**. Advances in ecological regime shift detection, *International Institute for Applied Systems Analysis*, Oral presentation. Laxenburg, Austria, 2018
4. **Burnett, J.L.**, N.B. Price, A.J. Tyre, T.J. Hefley, C.R. Allen, T. A. Eason, D.G. Angeler, and D. Twidwell. Community velocity as a regime shift detection method. *Great Plains Grassland Summit*, Poster presentation. Denver, Colorado, 2018
5. **Burnett, J.L.**, L. Wszola, N. Mirochnitchenko, E. Stuber, M. Bomberger Brown, C.R. Allen, D. Twidwell, and J.P. Carroll. Gray partridge distribution in North America: Changing landscapes and environment for an introduced species. *Perdix XIV and IUGB*, Oral presentation by JPC, Montpellier, France, 2017
6. **Burnett, J.L.**, N.B. Price, A.J. Tyre, T.J. Hefley, C.R. Allen, T. A. Eason, D.G. Angeler, and D. Twidwell. System trajectory and Fisher information as early-warning indicators of ecological regime shifts. *Resilience 2017: Resilience Frontiers for Global Sustainability*, Poster presentation. Stockholm, Sweden, 2017
7. **Burnett, J.L.**, N.B. Price, A.J. Tyre, T.J. Hefley, C.R. Allen, T. A. Eason, D.G. Angeler, and D. Twidwell. System trajectory and Fisher information as early-warning indicators of ecological regime shifts. *Ecological Society of America*, Poster presentation. Portland, OR, 2017
8. **Burnett, J.L.**, Roberts, C.P., Allen, C.R., Angeler, D.G., Twidwell, D., and Tyre, A.J. Ecological Regime Shifts in the Central Great Plains. *Great Plains Symposium*, Oral presentation. Nebraska Innovation Campus, Lincoln, NE, 2017
9. **Burnett, J.L.**, Roberts, C.P., Allen, C.R., Angeler, D.G., Twidwell, D., and Tyre, A.J. Using Big Data to Detect Regime Shifts in Space and Time. *North American Ornithological Conference VI*, Poster presentation. Smithsonian Migratory Bird Institute, Washington, D.C., 2016
10. **Burnett, J.L.**, Moulton, M. P., Sieving, K.E., Avery, M., and Robinson, S.K. Are House Sparrow declines a byproduct of urban greening? *Southeastern Ecology and Evolution Conference*, Oral presentation. University of Georgia, Athens, GA, 2015
11. **Burnett, J.L.**, Moulton, M. P., Sieving, K.E., Avery, M.L., and Robinson, S.K. Are House Sparrow declines a byproduct of urban greening? *American Ornithologists' Union and Cooper Ornithological Society Annual Meeting*, Poster presentation. Norman, OK, 2015
12. **Burnett, J.L.**, Moulton, M.P., and Sieving, K.E. House sparrow: the decline of a once ubiquitous, invasive species. *Florida Chapter of The Wildlife Society Annual Conference*, Poster presentation. Safety Harbor, FL, 2014.

13. **Burnett, J.L.**, Moulton, M. P., Sieving, K.E., Avery, M.L., and Robinson, S.K. House Sparrow decline and distribution in North Central Florida. *Florida Cooperative Fish and Wildlife Research Unit annual cooperators meeting*, Poster presentation. Gainesville, FL, 2014
14. **Burnett, J.L.** and Sieving, K.E. Detecting birds of prey using tufted titmouse distress calls. *USGS Florida Cooperative Fish and Wildlife Research Unit Committee Meeting*, Poster presentation. Gainesville, FL, 2013
15. **Burnett, J.L.** and Sieving, K.E. Do actual and perceived risks of small forest birds align? *Florida Ornithological Society Conference*, Oral presentation, St. Petersburg, FL, 2013
16. **Burnett, J.L.** and Sieving, K.E. Perceived predation risks of small forest birds. *Association of Field Ornithologists Annual Conference*, Poster presentation. Venus, FL, 2013

## Scientific Outreach

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### Community Involvement

Letters to a Pre-scientist, United States	2019-present
Skype a Scientist, United States	2017-present
Co-PI, Community grant to develop on-site nature trail and viewing opportunities at the Reichert House, Gainesville, FL	2014-15
Hands-on captive herpetological opportunities for studnets of the Reichert House, Gainesville, FL	2014-15
Birdwatching and live banding demonstrations for K-12 students, A Girls' Place, Gainesville, FL	2013-15
Science, mathematics and reading tutor for middle and high school students, Friends of the Micanopy Library, FL	2011-13
Learning assistant and tutor for geometry and pre-calculus students, Valencia Community College, Oralndo, FL	2008-10

### Blogs

[Connecting to nature and understanding ecosystem services: urban perspective](#), Envirobites  
[Big data, big problems](#), Resilience Alliance  
[Panarchy in the Anthropocene](#), Resilience Alliance - [Regime shifts, traps and how to deal with them](#), Resilience Alliance  
[Connecting to nature and understanding ecosystem services: the urban perspective](#), Resilience Alliance  
[Leadership resilience and your workplace](#), Resilience Alliance

### Radio

[House Sparrow declines in North American](#), Urban Wildlife Podcast

## Service

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### Journal Referee

*Bioinvasions Records* (1), *Ecological Modelling* (4), *Journal of Molluscan Studies* (2), *Journal of Open Source Software* (1), *PLOS One* (1), *Wilson Journal of Ornithology* (3)

Student liaison, [Urban Ecosystem Ecology Section](#), Ecological Society of America 2015 - 16

### University of Nebraska-Lincoln

Co-founder, Natural Resources Diversity Initiative committee, School of Natural Resources 2017  
 Co-founder, [Institutional membership to the Association for Women in Science](#) 2016  
[Faculty Advisory Committee](#), School of Natural Resources 2016-18



Digital Team, School of Natural Resources	2016
Organizer, Association for Women in Science <a href="#">Mentor Workshop</a>	2016
<a href="#">Seminar</a> Coordinator, School of Natural Resources	2016
Department Representative, UNL Graduate Student Association	2015 - 16

## Grey Literature

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### *White Papers*

1. **Burnett, J.L.**, Roberts, C.P., Allen, C.R., Angeler, D.G., Twidwell, D. 2017. White Paper: Regime Shift Detection Using Fisher Information. Strategic Environmental Research and Development Program (SERDP RC 25-10), Department of Defense.

### *Grant Reports*

1. Allen, C.R., Angeler, D.G., Twidwell, D., **Burnett, J.L.**, Roberts, C.P. 2017. Interim Report (RC 25-10): Global Change, Vulnerability, and Resilience: Management Options for an Uncertain Future. Strategic Environmental Research and Development Program (SERDP), Department of Defense.
2. Twidwell D., Bielski, C.H., **Burnett, J.L.**, Donovan, V.M., Wonkka, C.L. 2017. Review of LANDFIRE Biophysical Settings Models (BpS) in the Great Plains. LANDFIRE Project.