

Curriculum Vitae

TYLER J. GRANT, Ph.D.

Postdoctoral Research Associate
Iowa State University
Department of Natural Resource Ecology and Management
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EDUCATION

Ph.D., Wildlife Ecology, with a Minor in Statistics, May 9, 2015
Dissertation Title: “Anuran occupancy dynamics and an assessment of floodplain wetland distribution and hydrology in a Missouri River floodplain.”
Department of Natural Resource Ecology and Management
Iowa State University, Ames, IA
Advisors: Dr. David L. Otis and Dr. Rolf R. Koford

M.S., Wildlife Biology, December 2005
Thesis Title: “Flat-tailed Horned Lizards (*Phrynosoma mcallii*): Population Size Estimation, Effects of Off-Highway Vehicles, and Natural History.”
Department of Fish, Wildlife, and Conservation Biology
Colorado State University, Fort Collins, CO
Advisor: Dr. Paul F. Doherty, Jr.

B.S., Biology with emphasis in Ecology/Biodiversity, December 14, 2001
Department of Biology
Utah State University, Logan, UT

PROFESSIONAL EXPERIENCE

Postdoctoral Research Associate, July 2015 – present

- Developed a spatially-explicit agent-based model of monarch butterfly (*Danaus plexippus*) movement and egg-laying in cooperation with Iowa Monarch Conservation Consortium. This model will be used to evaluate spatio-temporal effects of pesticide drift and evaluate varying landscape-scale conservation scenarios for planting milkweed. Developed a Bayesian state-space model to estimate survival rates of monarch butterfly immature stages based on field

counts. Estimating survival rates of species that cannot be marked is a longstanding problem and my model is a significant development toward resolving that problem.

Graduate Research Assistant, August 2009 – May 2014
Iowa State University, Ames, Iowa

- Assessed wetland functionality of mitigation wetlands in the Missouri River floodplain. Multi-season occupancy estimation was used to estimate occupancy rates and habitat covariates associated with extinction and colonization rates from 2010 to 2013. A historic flood in 2011 produced interesting community dynamics.

Fish and Wildlife Biologist, October 2005 – July 2009
U.S. Fish and Wildlife Service, Carlsbad, California

- Developed and implemented monitoring and demographic parameter estimation studies for endangered species and other species of conservation concern, including the Coachella Valley Fringe-toed Lizard (*Uma inornata*), Coastal Cactus Wren (*Campylorhynchus brunneicapillus*), Flat-tailed Horned Lizard (*Phrynosoma mcallii*), and Laguna Mountains Skipper (*Pyrgus ruralis lagunae*). Section 7 and Section 10 implementation of the Endangered Species Act, including involvement with the Coachella Valley Multiple Species Habitat Conservation Plan.

Graduate Research Assistant, September 2003 – October 2005
Colorado State University, Fort Collins, Colorado

- Conducted research on effects of off-highway vehicles on Flat-tailed Horned Lizards using a manipulative experiment.
- Employed methods incorporating detection probability (distance sampling and mark-recapture) to monitor Flat-tailed Horned Lizards.

GRANTS

Key Project Personnel. 2017. Factors Influencing Spatially-Explicit Monarch Population Responses in Midwest Agroecosystems. \$737,005.00. National Institute of Food and Agriculture. Funded.

Co-PI. 2017. Fitness in a fragmented landscape: revealing the role of resource-perception capacity in a wild insect. National Science Foundation Pre-Proposal. Not funded.

Key Project Personnel. 2016. Factors Influencing Spatially Explicit Monarch Population Responses in Midwest Agroecosystems. \$499,015.00. National Institute of Food and Agriculture. Not funded, but ranked High Priority and invited to resubmit.

PUBLICATIONS

REFEREED JOURNAL ARTICLES

1. **Grant, T.J.** and S.P. Bradbury. *Invited Paper In Prep.* The role of modeling in monarch butterfly research and conservation. *Frontiers in Ecology and Evolution*. <https://www.frontiersin.org/research-topics/7657/north-american-monarch-butterfly-ecology-and-conservation>
2. **Grant, T.J.**, D.T.T. Flockhart, T.R. Blader, R.L. Hellmich, G.M. Pitman, D.R. Norris, and S.P. Bradbury. *Submitted.* Using stage-structured field counts to estimate larval survival probabilities in arthropods: An example using monarch butterflies (*Danaus plexippus*). *Biometrics*.
3. **Grant, T.J.**, D.L. Otis, and R.R. Koford. *Accepted.* Toward more informed amphibian conservation based on multiple life stage survey designs. *Journal of Herpetology*.
4. **Grant, T.J.**, H.R. Parry, M.P. Zalucki, and S.P. Bradbury. 2018. Predicting monarch butterfly (*Danaus plexippus*) movement and egg-laying with a spatially-explicit agent-based model: the role of perceptual range and spatial memory. *Ecological Modelling* 374:37-50. <https://doi.org/10.1016/j.ecolmodel.2018.02.011>
5. Vandergast, A.G., Wood, D.A., Thompson, A.R., Fisher, M., Barrows, C.W. and **Grant, T.J.**, 2016. Drifting to oblivion? Rapid genetic differentiation in an endangered lizard following habitat fragmentation and drought. *Diversity and Distributions* 22:344-357.
6. **Grant, T.J.**, D. L. Otis, and R. R. Koford. 2015. Short-term anuran community dynamics in the Missouri River floodplain following an historic flood. *Ecosphere* 6:197. <http://dx.doi.org/10.1890/ES15-00011.1>
7. Leavitt, D.J., Collins, J., Crawford, C., Crayon, J., **Grant, T.J.**, Heatwole, N.B., Hollenbeck, E.V., Ingraldi, M.F., Piest, L., Ponce, K. and Powell, R.J., 2015. Multiyear monitoring (2007-2013) of flat-tailed horned lizards (*Phrynosoma mcallii*). *Herpetological Conservation and Biology* 10:189-202.
8. **Grant, T.J.**, P.G. Eyheralde, M.S.C. Telemeco, A.L. Moorhouse, R.A. Reeves, K. Grimlund, A. Podaril, S.E. Emeterio, R. Klaver. 2014. Surrogate species: Fraught with difficulty. Book Review of *Conservation by Proxy* by Tim Caro. *The Prairie Naturalist* 46:109-110.

9. **Grant, T.J.** 2013. UROSAURUS ORNATUS (Ornate Tree Lizard). Geographic Distribution. *Herpetological Review* 44:627.
10. **Grant, T.J.**, and P.F. Doherty, Jr. 2009. Potential mortality effects of off-highway vehicles on the flat-tailed horned lizard (*Phrynosoma mcallii*): A manipulative experiment. *Environmental Management* 43:508-513.
11. **Grant, T.J.**, and P.F. Doherty, Jr. 2008. *Phrynosoma mcallii* (Flat-tailed Horned Lizard). Rain-harvesting. *Herpetological Review* 39:90.
12. **Grant, T.J.**, and P.F. Doherty, Jr. 2007. Monitoring of the flat-tailed horned lizard with methods incorporating detection probability. *Journal of Wildlife Management* 71:1050-1056.
13. **Grant, T.J.**, and P.F. Doherty, Jr. 2006. *Phrynosoma mcallii* (Flat-tailed Horned Lizard). Hibernation. *Herpetological Review* 37:346-347.

CONFERENCE PROCEEDINGS

Bradbury, S.P., T. Grant, and N. Krishnan. 2017. Iowa monarch conservation, pest management, and crop production. Proceedings of the 29th Annual Integrated Crop Management Conference. Iowa State University.

TECHNICAL REPORTS

Grant, T.J. 2014. Missouri River Mitigation: Iowa Wetland Restoration Functional Assessment Supplemental Report. Submitted to the U.S. Army Corps of Engineers July 31, 2014. 64 pp.

Whiteman, K., Garner, D., Travnichek, V., Drimmel, D., Godin, M., Simon, M., Hellman, M., VanderHam, A., Allen, C., **Grant, T.**, Otis, D., Koford, R. 2013. Missouri River Mitigation: Implementation of Amphibian Monitoring and Adaptive Management for Wetland Restoration Evaluation. Annual Report 2012. Technical Report to U.S. Army Corps of Engineers.

Whiteman, K., Garner, D., Travnichek, V., Drimmel, D., Godin, M., Simon, M., Hellman, M., VanderHam, A., Allen, C., **Grant, T.**, Otis, D., Koford, R. 2012. MISSOURI RIVER MITIGATION: Implementation of Amphibian Monitoring and Adaptive Management for Wetland Restoration Evaluation. Annual Report 2011. Technical Report to U.S. Army Corps of Engineers.

Whiteman, K., Garner, D., Travnichek, V., Drimmel, D., Prentice, A., Simon, M., Hellman, M., Allen, C., **Grant, T.**, Otis, D., Koford, R. 2011. MISSOURI RIVER MITIGATION: Implementation of Amphibian Monitoring and Adaptive Management

for Wetland Restoration Evaluation. Annual Report for 2010. Technical Report to U.S. Army Corps of Engineers.

Grant, T.J., S. Ostermann-Kelm, C. McGary, M. Koski, K. Roblek, and P. Sorensen. 2009. DRAFT: Laguna Mountains Skipper Investigations 2007-2008: Informing Recovery with Surveys to Determine Distribution, Natural History, and Ecology. Carlsbad Fish and Wildlife Office, Carlsbad, California. February 2009. 75 pp.

Flat-tailed Horned Lizard Monitoring Plan. Flat-tailed Horned Lizard Interagency Coordinating Committee, **T. Grant**, Monitoring Coordinator. January 2008.

Grant, T.J., San Diego Multiple Species Conservation Program Animal Monitoring Protocols: Coastal Cactus Wren (*Bruneicapillus campylorhynchus cousei*). February 28, 2008.

Grant, T.J., San Diego Multiple Species Conservation Program Animal Monitoring Protocols: Tricolored Blackbird (*Agelaius tricolor*). February 28, 2008.

PRESENTATIONS

Grant, T.J. Invited Departmental Seminar. Modeling Monarch Butterfly Populations. October 12, 2018. Joint Seminar, Department of Natural Resource Ecology and Department of Entomology, Iowa State University.

Grant, T.J. H.R. Parry, M.P. Zalucki, and S.P. Bradbury. Invited Presentation. A landscape scale spatially-explicit agent-based model of monarch butterfly movement and egg-laying. Monarch Butterfly Symposium. March 18-21, 2018. North Central Branch Meeting, Entomological Society of America.

Grant, T.J. H.R. Parry, M.P. Zalucki, and S.P. Bradbury. Exploring behavioral landscape ecology with monarch butterflies. November 5-8, 2017. Entomological Society of America Annual Conference, Denver, CO.

Grant, T.J. The Monarch Butterfly and the Endangered Species Act. Iowa State University Monarch Working Group. July 18, 2017.

Grant, T.J. Invited Presentation. Flat-tailed horned lizards: perspectives on monitoring. Flat-Tailed Horned Lizard Symposium, Anza-Borrego Desert Research Center, May 26, 2017.

Grant, T.J. and S.P. Bradbury. Invited Presentation. A monarch movement and egg-laying model. Monarch Science Conservation Partnership Meeting, USGS Powell Center, Fort Collins, CO. January 10, 2017.

Grant, T.J. and S.P. Bradbury. Invited Presentation. A Spatially Explicit Monarch Movement and Egg-laying Model. Monarch Joint Venture Annual Meeting, Bloomington, MN. November 17, 2016.

Grant, T.J. and S.P. Bradbury. A Monarch Movement and Egg-laying Model. Invited Webinar for the U.S. Fish and Wildlife Service Species Status Assessment Team. October 12, 2016.

Grant, T.J., H.R. Parry, M.P. Zalucki, and S.P. Bradbury. Modelling monarch butterfly movement and egg-laying in a spatially-explicit Iowa, USA, landscape. Invited Paper for the Symposium: Arthropod Movement in Agro-Ecosystems: Linking Individual Behaviours and Population Patterns across Spatio-Temporal Scales. Just What Does Emerge? September 27, 2016. International Congress of Entomology, Orlando, FL.

Grant, T.J., H.R. Parry, M.P. Zalucki, and S.P. Bradbury. Modelling Monarch Butterfly (*Danaus plexippus*) Movement and Egg-Laying in a Spatially-Explicit Iowa Landscape. North Central Branch, Entomological Society of America, June 8, 2016.

Grant, T.J., D.L. Otis, and R.R. Koford. Resilience of an Amphibian Community after a Catastrophic Flood using Information from Multiple Life Stages. The Wildlife Society Annual Conference, October 25-30, 2014, Pittsburgh, Pennsylvania.

Grant, T.J., D.L. Otis, and R.R. Koford. Amphibian Resilience at Mitigation Sites in the Missouri River Floodplain Following a Catastrophic Flood. 2014 Missouri River Natural Resources Conference and BiOp Forum, March 11-13, 2014, Nebraska City, Nebraska.

Grant, T.J., D.L. Otis, and R.R. Koford. Herpetofauna Use of Mitigation Wetlands in the Missouri River Floodplain in Iowa in 2012. 2013 Missouri River Natural Resources Conference and BiOp Forum, March 11-13, 2013, Jefferson City, Missouri.

Grant, T.J., D.L. Otis, and R.R. Koford. Amphibian Resilience at Mitigation Sites in the Missouri River Floodplain Following a Catastrophic Flood. The Wildlife Society Annual Conference, October 5-10, 2013, Milwaukee, Wisconsin.

Grant, T.J., D.L. Otis, and R.R. Koford. Effects of the 2011 Missouri River Flood in Monona County, IA, and Burt County, NE. Invited Presentation. Iowa Department of Natural Resources Annual Biologists Meeting, October 10, 2012.

Grant, T.J., D.L. Otis, and R.R. Koford. Evaluating Amphibian Resilience to Missouri River Flooding Using Occupancy Modeling. World Congress of Herpetology, August 8-14, 2012, Vancouver, Canada.

Grant, T.J., D.L. Otis, and R.R. Koford. Herpetofauna Response to the 2011 Missouri River Flood at Mitigation Sites in Iowa. 2012 Missouri River Natural Resources Conference and BiOp Forum, March 14-16, 2012, Pierre, South Dakota.

Grant, T.J., D.L. Otis, and R.R. Koford. Monitoring of Herpetofauna in Wetland Restorations: The Missouri River Floodplain in Iowa. 2011 Missouri River Natural Resources Conference and BiOp Forum, March 9-11, 2011, Nebraska City, Nebraska.

Grant, T.J., D.L. Otis, and R.R. Koford. Pilot Study and Plans for Herpetofauna Monitoring in Iowa. 2010 Missouri River Natural Resources Conference and BiOp Forum, March 16-19, 2010, Nebraska City, Nebraska.

Grant, T.J. Monitoring Coastal Cactus Wrens for the San Diego Multiple Species Conservation Program. Symposium: Conservation & Management of the Coastal Cactus Wren in Southern California. Nature Reserve of Orange County, Irvine, California. April 1, 2008.

Grant, T.J. The Flat-tailed Horned Lizard: Abundance Estimation, Mortality due to Off-Highway Vehicles and Natural History. Exit Seminar at Colorado State University. September 9, 2005.

Grant, T.J. and P.F. Doherty. The Effects of Off-Highway Vehicles on Flat-tailed Horned Lizards: A Manipulative Experiment. The Wildlife Society Annual Conference. September 25-29, Madison, Wisconsin.

Grant, T.J. and P.F. Doherty. The Flat-tailed Horned Lizard: Mortality Due to Off-Highway Vehicles and Estimation of Abundance and Density. Invited Presentation. Fish and Wildlife Service, Carlsbad, CA.

Grant, T.J. and P.F. Doherty. Abundance Estimation of the Flat-tailed Horned Lizard, *Phrynosoma mcallii*: Using closed-population mark-recapture methodology. Intermountain Herp Rendezvous II. Utah State University, Logan, UT.

POSTERS

Grant, T.J., N. Krishnan, and S.P. Bradbury. 2017. Spatially explicit estimates of monarch butterfly (*Danaus plexippus*) population responses to insecticide spray drift exposure in an Iowa agroecosystem. Entomological Society of America Annual Conference, November 5-8, 2017. Denver, CO.

Koski, M.L, J.E. Pagel, **T. Grant,** P. Sorensen, L. White, and K. Roblek. 2009. Laguna Mountains skipper: A coastal montane butterfly at the vanguard of climate change. Carlsbad Fish and Wildlife Office, USFWS. Climate Change Workshop on Coastal Ecosystems of California, Oregon, and Washington. Sponsored by the U.S. Fish and Wildlife Service and U.S. Geological Survey. Jan 29-30, 2009. San Francisco, CA.

POPULAR MEDIA

“Milkweed, Monarchs and Models.” *STORIES in Agriculture and Life Sciences* 10(2). College of Agriculture and Life Sciences, Iowa State University.

TEACHING EXPERIENCE

UNIVERSITY COURSES:

Guest Lecture: Quantitative Methods for Wildlife Management and Conservation. February 5, 2018. Iowa State University, AECL 231X Principles of Wildlife and Fisheries Management.

Graduate Teaching Assistant, Biol 312L: Ecology Lab, Iowa State University, Fall 2014. Responsible for 2 sections/40 students. A writing intensive course in which students learn scientific writing format along with principles of ecological experimentation.

Guest Lectures and Lab: Occupancy Modeling (2 Lectures and 1 Lab), A Ecl 371: Ecological Methods, Iowa State University, Fall 2013.

Graduate Teaching Assistant, FW 471: Wildlife Data Collection and Analysis, Colorado State University, Fall 2003 and Spring 2004.

WORKSHOPS:

Teaching Assistant. January 2005. Introduction to Distance Sampling.

PROFESSIONAL AFFILIATIONS

Entomological Society of America (2015 – present)

Society for the Study of Reptiles and Amphibians (2003 – present)

The Wildlife Society (2010 – present)

Biometrics Working Group of The Wildlife Society (2010 – present)

PROFESSIONAL SERVICE

Iowa State University Postdoctoral Association
Treasurer, 2018-2019

Iowa State University Benefits Committee
Postdoctoral Association Representative, 2018-2019

Reviewer for:

Ecological Modelling, 2018a

Ecological Modelling, 2018b

PeerJ, 2018

Freshwater Biology, 2016

Herpetological Journal, 2016

Journal of Herpetology, 2015

Biological Conservation, 2014

Oikos, 2013
Herpetological Conservation and Biology, 2009
Journal of Wildlife Management, 2007
Environmental Management, 2006

ADDITIONAL TRAINING RECEIVED

Preparing Future Faculty

Instructors: Karen Bovenmeyer and Holly Bender

Completed two semesters of the Iowa State University Preparing Future Faculty Course

Awarded Preparing Future Faculty Associate

Fall/Spring 2017/2018

Advanced MARK Workshop

Instructors: Dr. Gary White, Dr. Larissa Bailey, Dr. Bill Kendall, Dr. Evan Cooch, Dr.

Brett McClintock, Dr. Jake Ivan, Dr. Brett Collier, Dr. Ken Burnham

August 4-8, 2013, Colorado State University, Fort Collins, CO

Interagency Consultation for Endangered Species (ECS3116)

October 23-27, 2006, Carlsbad, California

Four-wheel drive training, Imperial Sand Dunes, 2003

All-terrain vehicle training, Imperial Sand Dunes, 2002

SKILLS

R and RStudio

Various R packages: RMARK, unmarked, rjags, move

Repast Symphony

Java

ArcGIS

Program MARK

Program PRESENCE

JAGS, WinBUGS

MS Excel, MS Access, MS Word

REFERENCES

Dr. Steven P. Bradbury
Professor
Department of Natural Resource Ecology and Management
Iowa State University
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Dr. David L. Otis (retired)
Professor
Iowa Cooperative Fish & Wildlife Research Unit Leader
Iowa State University
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Collaborating Professor
Department of Fish, Wildlife, and Conservation Biology
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Fort Collins, CO 80523
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Dr. Rolf R. Koford (retired)
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Iowa Cooperative Fish & Wildlife Research Assistant Unit Leader
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Dr. Sue L. Blodgett
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